



MODEL PVC - 766 E

VIDEO CASSETTE RECORDER SERVICE MANUAL

ORDER NO. 549910210



**Better Service
Better Reputation
Better Profit**

TECHNICAL SPECIFICATIONS OF PVC-766E

General

Video recording system Rotary two-head helical scanning
Video signal CCIR standards, PAL color
Storage temperature -20°C to $+65^{\circ}\text{C}$
Operating temperature 5°C to 40°C

Aerial 75-ohm, asymmetrical aerial socket

Channel coverage VHF Western European Channels E2-12.
UHF Western European Channels E21-69
(a total of up to 12 preselected channels)

RF output signal UHF channels E30 to E39 (variable)
75 ohms, unbalanced

Power requirements AC $220\text{V} \pm 10\%$, 50 Hz

Power consumption 35W

Dimensions 430 (W) x 350 (D) x 150 (H) mm

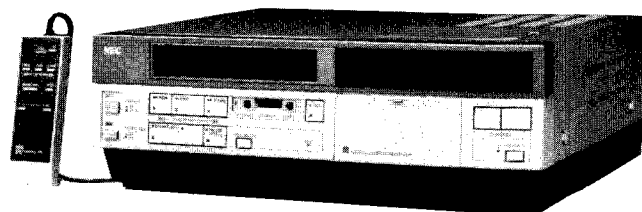
Weight 9.5kg (approx.)

Video

Input VIDEO IN: BNC connector
 $1.0\text{V (p-p)} \pm 0.5\text{V (p-p)}$, 75 ohms
unbalanced, sync negative
Output VIDEO OUT: BNC connector
 $1.0\text{V (p-p)} \pm 0.2\text{V (p-p)}$, 75 ohms
unbalanced, sync negative
Horizontal resolution Color: 250 lines
Signal-to-noise ratio Color: Better than 40 dB

Audio

Input AUDIO IN: Phono connector
47k ohms, -10 dBs ,
Output AUDIO OUT: Phono connector
Less than 10k ohms, -5 dBs
(47k ohm load), unbalanced
Frequency response 50 Hz to 10kHz
Signal-to-noise ratio Better than 40 dB
Audio distortion Less than 4% at 400 Hz



Tape transport

Tape speed 18.73 mm/se.
Maximum recording time 2 hours 10 min (with L-500 cassette)
3 hours 15 min (with L-750 cassette)
Fast forward/rewind time Within $4\frac{1}{2}$ min (with L-500 cassette)

Timer

Only for recording
Electronic digital timer
24 hour indication

Accessories supplied

Remoto Control Unit RB-76E 1 piece
75-ohm coaxial cable 1 piece
Channel number sheet 1 sheet
Band selector 1 piece

Design and specifications are subject to change without notice.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND A MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH NEC PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY NEC. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

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TOKYO JAPAN

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SECTION 1

GENERAL

1-1-1. General Notes

- This machine is designed for operation with 220V, AC power.
- This recorder is designed for operation in a horizontal position.
- Do not install the recorder in a location near heat sources, such as radiators, air ducts or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Allow adequate air circulation to prevent internal heat buildup. Do not place the recorder on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation holes.
- Keep the recorder and video cassettes away from strong magnetic fields.
- After playing the tape, remove the video cassette from the compartment if the recorder is not to be used for any length of time.
- Do not transport the recorder with a video cassette in place.
- To disconnect the cords, pull it out by the plug. Never pull the cord itself.
- Generally, head cleaning by yourself is not required. Should snow or streaks appear in the playback picture after having used the recorder for an extended period of time, consult your nearest NEC dealer.
- Should any liquid or solid object fall into the cabinet, unplug the recorder and have it checked by qualified personnel before operating it any further.
- Save the original shipping carton and packing material; they will come in handy if you ever have to ship your recorder.
- For maximum protection, repack the recorder as it was originally packed at the factory.
- This machine is designed to record and playback the PAL color video signal.
- Do not place any magnetism emitting device, e.g. TV set, etc. on top of the VCR. Otherwise, noise or screen disturbance will be created, so be careful. Also, do not place any object heavier than 10 kg on the VCR.

Television programmes, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of copyright laws.

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1-1-2. Features

Motorized Automatic Front Cassette Loading

Simply insert a video cassette into the front panel slot and the PVC-766E takes over from there to complete loading process. The loading motor moves the cassette automatically and quietly so that it is properly positioned for the optimum tape/head contact.

Full Front Operation

Designwise, the PVC-766E places maximum emphasis upon operability. As well as the tape loading slot and fluorescent display, everything required for operation is conveniently located on the front panel. All the controls which are necessary when you are using the recorder itself including tape transport controls, channel select buttons and programming buttons are always visible and accessible.

Picture Search

With the picture search, you can speed through unwanted recorded material with pictures at approximately 15 times normal speed to quickly find the program you are interested in.

This picture search can also be operated in reverse mode to provide an "instant reply" of what has just been seen.

Feather Touch Logic Controls

PVC-766E gives you light-touch microprocessor controls for smooth and reliable tape transport operation.

With its full logic controls, you never have to press the stop button between operating modes.

1-week/1-program Timer for Unattended Recording

Now you can be away from home and never miss your favourite TV programs. Built-in memory circuit and precision timer synchronized with AC Power Line frequency let you preset the VCR to record 1 programs of set up channel to 1 week in advance.

Mode Remote Control

Sitting in your most comfortable armchair, you can command 9 tape transport operations; REC, FWD, STOP, FFWD, REW, PAUSE (STILL), PICTURE SEARCH (FWD, REV) and the channel scan button (up and down button) with the attached remote control unit.

Channels Preset Tuner / LED Display

Once the 12 channels have been preset, channel selection is done by simply pressing a feather touch button. And receiving channel is displayed on LED indicator.

Auto Rewind Convenience

When the tape comes to the end, it is automatically rewound to the beginning of the tape (AUTO REWIND).

Pause Control / Still Playback

The pause control lets you edit out commercials or unwanted scenes during recording.

In playback mode, the tape may be momentarily stopped for a "still picture" by touching the pause button.

Still Adjust

In STILL mode, if the still picture is noisy so that noise position is adjusted by touching the STILL ADJUST Button.

Record One Program while Watching Another

With its own built-in tuner, recording of one program is possible while watching another on your TV receiver.

Memory Tape Counter

When the VCR rewinds the tape with MEMORY-IN condition, it stops automatically at a point near the counter reading "9999" (one count before "0000" to avoid missing starting point).

One Touch Recording

Recording simplicity is always yours with PVC-766E. Simply load a video cassette and just push the recording button to start recording.

1-1-3. Circuit Description

The circuitry of the PVC-766E is constructed with the following main circuit boards.

Y Process

Y signal record/playback process.

Preamp & Chroma Process

Preamplifier and recording amplifier for video signal and chroma signal record/playback process.

Servo/Audio

Capstan and Drum servo circuit and Audio record/playback circuit.

Function

Function key group and Display lamp group.

Syscon

System control circuit.

Timer

Program timer circuit.

TU-VIF

U & V tuner, VIF, SIF & AFT circuit.

PST

Tuner preset.

A lot of highly integrated circuits (LSI) are used in this machine. The complicated controls of the machine are alone by microcomputers used for the system control and timer sections.

The ICs used on the circuit boards are as follows.

Y PROCESS

LA7020

Recording process (AGC, Pre-emphasis and FM modulation) for Y signal.

LA7025

Playback process (FM demodulations, De-emphasis and noise canceller) for Y signal.

CHROMA PROCESS

CX-136A

Color process (ACC, ACK, DET, Freq. converter)

CX-150B

PHASE detect circuit for CHROMA IDENT.

CX-832

APC & AFC circuit

CX-145

Sync separation circuit for colour APC.

LA7019

Colour or video signal switch circuit.

M58478P

Servo reference counter.

SN74LS93

Counter

SN74LS74

Counter

SN74LS10

NAND gate.

Preamplifier

CX134A

RF signal playback amplifier & drop out compensation circuit.

Function

μPC393C

Operation amplifier.

LB1475

Remote control signal decoder.

Timer

TMS-1270 (MP-2517)

Timer control circuit

μPA81C

Buffer amplifier.

Servo

μPC1504C

Drum servo circuit

μPC1505C

Capstan servo circuit

Audio

LA7040

Audio recording/playback circuit

Syscon

μPD546C-330

System control

μPD4503BC

Tri-state buffer for key matrix circuits

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VIDEO CIRCUIT

The video signal circuit consists of an Y process board and a chroma/preamplifier board. In the Y process board, a chrominance signal recording and playback circuit and a test signal generator circuit are mounted; in the chroma/preamplifier board, a chroma signal processing circuit, a color sync signal processing circuit, a pre-amplifier, a recording amplifier, and a servo reference generator circuit are mounted.

1. Recording System

The input video signal is supplied to the Y process board for use as a chrominance signal, and to the chroma/preamplifier board for use as a chroma signal.

1.1 Y Signal System

The input video signal supplied to the Y process board is fed to IC1 LA7020 via a sound trip circuit (PVC-766E is 5.5 MHz). The recording process of the chrominance signal is done by means of LA7020 in all cases. First, after level adjustment is made through AGC, the chroma signal is removed by the low-pass filter (LPF). Also, after clamping, pre-emphasis is added for frequency modulation. Not only does the pre-emphasis effects non-linear emphasis based on B format, but also causes the control of $\frac{1}{2}$ fH shift to be added for reducing crosstalk between adjacent tracks. Also, white clip and black clip are made so as to prevent over-modulation from occurring. The signal subjected to the frequency modulation will have its component in the band occupied by the chroma signal removed by the 44 fH trap and then supplied to the recording amplifier in the chroma preamplifier board.

1.2 Chroma Signal

The chroma signal component of the input video signal fed to the chroma/preamplifier board is taken out by the band-pass filter and then supplied to IC201 CX136A. In IC201, the chroma level is first adjusted by the ACC circuit, and a pilot burst is added to it, after which the signal is converted into a low carrier chroma signal by the frequency converter and supplied to the recording amplifier. The pilot burst is intended to be inserted in to improve the signal-to-noise ratio of APC at the time of playback. The subcarrier phase locked to the burst signal component of the input video signal is added to the H SYNC section as a pilot burst.

2. Playback System

The playback signal from the video head is extremely low level. So, it is first amplified by the preamplifier. After that, this signal is separated between the chrominance signal component and the color signal component and then fed to the respective processing circuits.

2.1 Y Signal System

The output from the preamplifier of IC2 LA7025 on the Y process board is fed into the FM DEMOD circuit via the DOC circuit where it is demodulated and then passed through the de-emphasis circuit and the noise canceller circuit. As a result, a chroma signal played back by the chroma playback circuit is mixed and then output as a playback video signal. The DOC circuit causes the dropout generated on the tape to be displaced by a signal 1 fH before it for improvement of noise caused by dropout to the extent it will not be unsightly.

2.2 Chroma System

The chroma component of the output signal from the preamplifier only is taken out by the LPF, and fed to the chroma processing IC (IC201) used at the time of recording, after which it is converted into a normal 4.43 MHz color signal from the low carrier color signal. The crosstalk of the signal between

adjacent tracks is removed by the 2H comb filter and sent to the Y/C MIX circuit as a playback color signal.

3. Color Sync Signal System

The color sync signal system generates an idler signal for conversion into a low carrier at the time of recording and into a 4.43MHz carrier at the time of playback. At the time of recording, +44H is generated by cc (4.43MHz) locked to the burst of the input video signal, and 44H locked to H SYNC signal. Also, at the time of playback, the APC circuit is operated to generate an idler signal so that the playback pilot signal can be phase locked with the reference fsc.

AUDIO CIRCUIT

The audio circuit is mounted in the servo/audio board. This circuit consists of one integrated circuit and several transistors. Automatic gain control (AGC), recording equalization, playback equalization, and all necessary amplification are done by one IC. Transistors are used not only for oscillation of bias and erase signals, but also for recording/playback switching.

SERVO CIRCUIT

All the servo circuits are mounted in the servo/audio board. As servo circuits, the drum servo circuit, capstan servo circuit, and reel motor control circuit are provided.

1. Drum Servo Circuit

The drum is direct driven from the drum motor.

The drum servo circuit keeps motor speed at the fixed RPM by the PG signal obtained from the PG coil incorporated in the drum. This circuit makes phase comparison between the PG signal and the vertical sync signal separated from the input signal at the time of recording, and between the PG signal and the reference signal prepared by countdown from the color subcarrier at the time of playback. In so doing, the rotation phase of the drum is kept constant.

2. Capstan Servo Circuit

The capstan servo circuit is designed to: 1) to keep the tape speed at a constant speed and 2) to serve as a tracking servo at the time of playback. For capstan drive, the DC motor is used. The DC motor is subject to speed servo by FG and also to the phase servo to make phase comparison between the 25Hz prepared by countdown of the PG signal and the RF switching pulse at the time of recording, and to make phase comparison between the CTL signal played back by the tape and the RF switching pulse at the time of playback.

3. Reel Motor Control Circuit

This circuit controls the supply voltage to the reel motor for control of the tape speed at the time of cue and review. It meters the CTL signal cycle and causes the supply voltage to the reel motor to be varied for keeping the cycle nearly constant.

SYSTEM CONTROL CIRCUIT

The system control circuit consists of a SYSCON board and a function board. On the function board, the function switch and mode display LED, remote control signal decoding IC, LB1475, TU sense signal and dew sense signal amplifying IC (μ PC393) are mounted, and on the SYSCON board, a microcomputer μ PD546C-330 and microcomputer input data switching IC μ PD4503, FWD sensing circuit, REW sensing circuit and motor drive circuit in addition, are mounted.

The μ PD546C-330 sends out necessary signals to each circuit and each motor while taking the timing on reception of data from CN3 indicating the status of function switch and cassette house, data from the cam switch (CN4) indicating the status of loading ring, and data from the FWD sensor, REW sensor, and TU sensor.

TIMER CIRCUIT

The timer circuit is designed around a microcomputer TMS-1270 (MP-2517). It has the timer function of one program per week.

The microcomputer has the functions of a timer counting, program memory, and time collation.

HIGH FREQUENCY CIRCUIT

The high frequency circuit consists of a TU-VIF board, a PST board, and an amplifier terminal strip. It has the functions of receiving a TV program and sending a VCR playback signal to the TV receiver.

1. TU-VIF Board

The TU-VIF board contains a U/V combination tuner VIF, and SIF. It demodulates the video signal and voice signal from the TV radio wave and sends them out as recording signals.

2. PST Board

The PST board has a presetting potentiometer (band select switch mounted in), and a station selection IC μ PC1363C. The μ PC1363C selects the designated presetting section upon reception of CHU and CHD signals from the timer board.

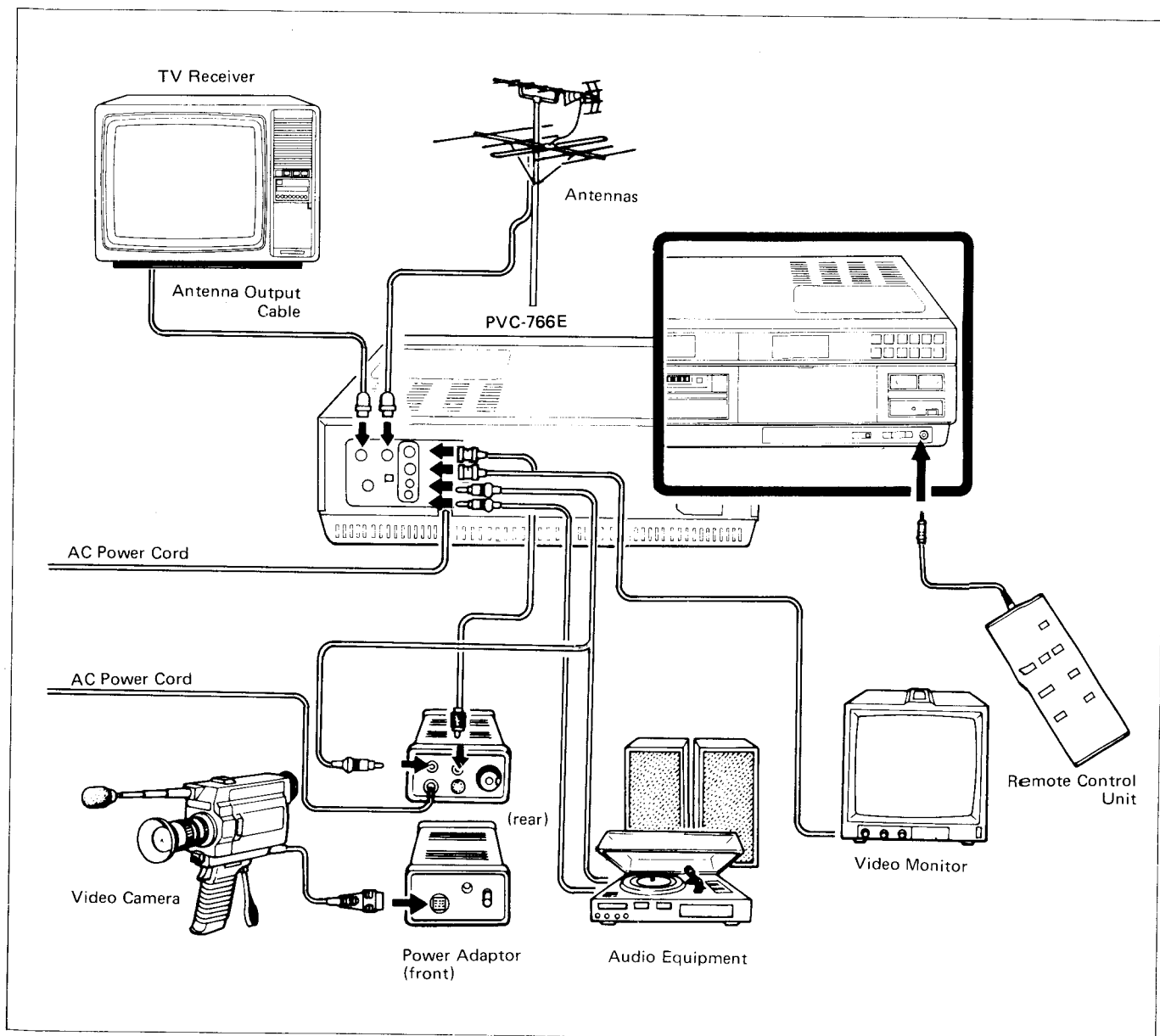
3. Antenna Terminal Strip

The antenna terminal strip contains a RF modulation with in antenna switch.

The antenna switch has the distribution function for distributing the received radio wave to the tuner and TV receiver inside the VCR, the burst function for equalizing the loss generated as a result of distribution, and the switching function for switching it to the TV radio wave received as a signal to be sent to the TV receiver or to a signal from the VCR. The RF modulator modulates the signal played back by the VCR to a RF signal of 30 to 39 CH UHF band so that it can be received by the TV receiver.

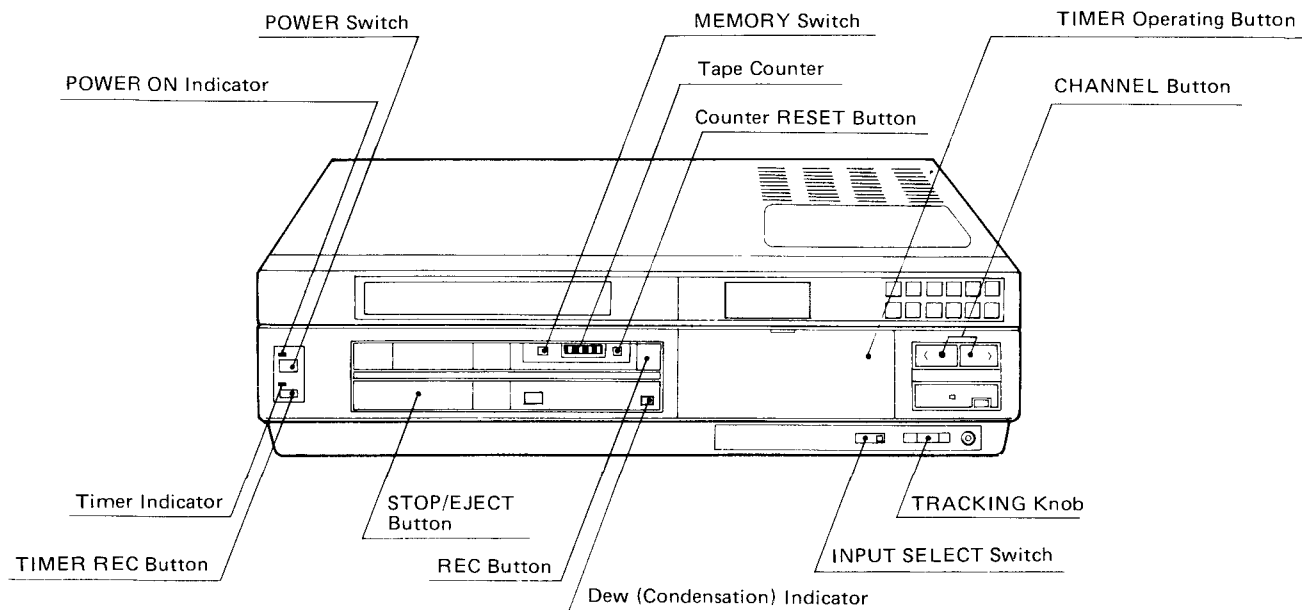
1-2. CONNECTION AND OPERATION

INSTALLATION AND CONNECTION OF THE RECORDER



* **Note:** The video input and output connectors are the BNC type.

IDENTIFICATION AND OPERATION OF CONTROLS (A)



POWER Switch

When pushing this button while the MAIN POWER switch on the rear is ON, power is supplied and the power pilot lamp (green) lights up. To turn ST-BY, push the button once again.

POWER ON Indicator

Illuminates when the POWER Switch is pressed.

TIMER REC Button

Push this button to set recording timer (unattended). The timer lamp (red) lights up.

TIMER Indicator

Illuminates when the TIMER REC button is pressed.

TRACKING Knob

Normally used only when playing back a cassette recorded on another recorder, this control provides a compatibility adjustment of video head tracking for noise-free pictures. If tracking noise (a narrow horizontal noise pattern across the picture) is observed, adjust the tracking by rotating the TRACKING control to the right or left. The TRACKING control should be kept in the mid (notch) position when playing back cassettes recorded on the same machine.

DEW (Condensation) Indicator

When the VCR is abruptly moved from a cool area to warm area, condensation may form inside the unit.

CHANNEL Button

This is the selector for the TV channel (TV station) to be recorded.

TIMER Operating Button

Use this for time setting or (unattended) timer recording.

Tape COUNTER

Indicates tape position. This is convenient to locate a particular point on the tape.

Counter RESET Button

Press to reset the tape COUNTER to "0000".

MEMORY Switch

Use this together with the tape counter above to search for a particular portion of the tape.

ON: When the tape is fully rewound, the counter automatically stops at 0000.

OFF: Memory functions do not work. Set the recorder to this position during normal tape operation.

STOP Button/EJECT Button

Push this button to stop the tape while the tape is running. When pushed while the tape is stopped, the tape is ejected.

REC Button

When pushed, the recording lamp (red) lights and recording (picture and sound) starts.

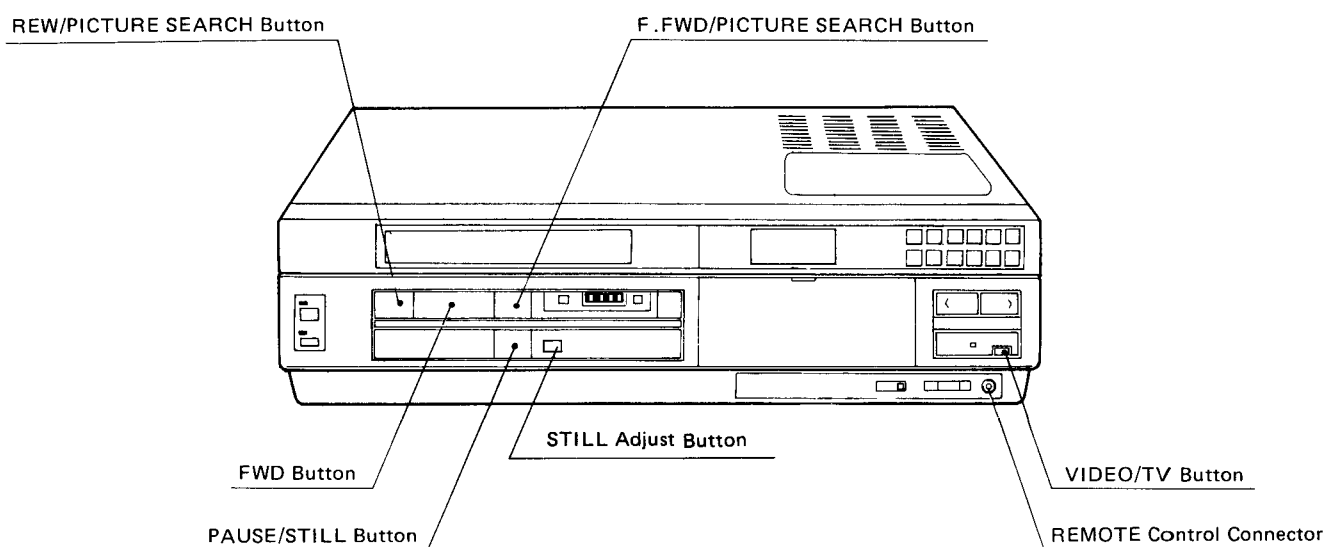
INPUT SELECT Switch

Provides convenient selection of the video and audio sources to be recorded.

TUNER: Video and audio from the tuner section is recorded.

LINE: External video and audio input from the VIDEO INPUT and AUDIO INPUT connectors is recorded.

IDENTIFICATION AND OPERATION OF CONTROLS (B)



VIDEO/TV Button

Switch this according to the programme choice.

Or to watch a programme selected by the channel button.

TV: To watch TV (when turning power ON or OFF, This mode is automatically selected.)

VIDEO: To playback a video cassette (when pushing the FWD button, this mode is automatically selected.)

When the button is pushed once, the video lamp (green) lights up while setting the recorder to (VIDEO) mode, when pushed again, the video lamp goes out and (TV) mode is established.

REW Button/PICTURE SEARCH Button

This button is used for both rewind and reverse search. Press this button for high speed tape rewind. Press this button during the playback mode for soundless, high speed colour picture playback. This is convenient for visually scanning back to any desired position on the tape. Press the FWD button to return to the standard playback mode.

F.FWD Button/PICTURE SEARCH Button

This button is used for both fast forward and forward search. Press this button for high speed tape advance and, used with the tape COUNTER, for fast location of programme material. Press this button during the playback mode for soundless, high speed colour picture playback. This is convenient for scanning through unwanted programme material or for visually locating the beginning of a programme. Press the FWD button to return to the standard playback mode.

FWD Button

When this button is pressed, the FWD indicator illuminates and the prerecorded video cassette is played back.

PAUSE/STILL Button

Stops the tape movement in the record or playback mode. During recording, press this button to avoid recording unwanted material. Press again to resume normal recording. During playback, press this button for still picture viewing. Press again to resume normal playback.

Note: If the video recorder is left in the pause or still mode for about 5 minutes, it is automatically turned off in order to protect the tape.

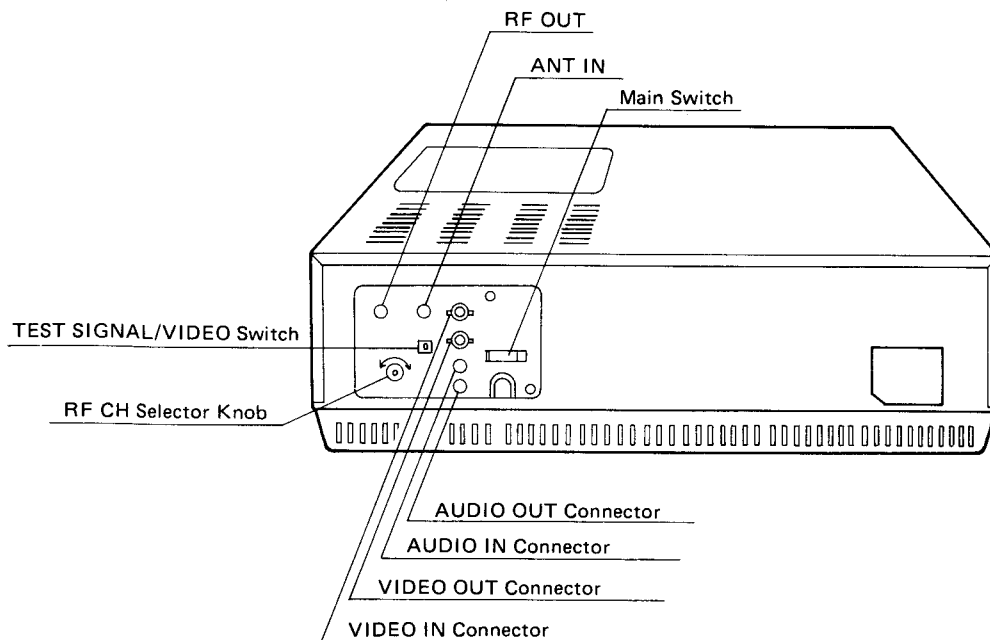
STILL Adjust Button

During STILL, press this button for noise bar position is adjustment.

REMOTE Control Connector

The Remote Control Unit should be connected to this connector.

IDENTIFICATION AND OPERATION OF CONTROLS (C)



ANT IN Connector

The lead wire from the antenna should be connected to this 75-ohm input connector.

RF OUT Connector

A 75-ohm connector cable should be connected to this output. The other end of the cable (standard accessory) should be connected to the antenna connector of the television. Recorded and playback programmes are converted to TV signals (adjustable between channels 30–39) and sent to the TV Set from this terminal. TV Signals received by the antenna are also transmitted from here to the TV Set.

RF CH Selector Knob

This is to adjust the signal transmitted from the RF out Connector. Fine adjustment is made with a small screwdriver.

TEST/V Switch

For convenience to adjust the channel of a TV receiver to the RF output signal of the VCR, a test signal generator is self contained. This switch selects the test signal or recording and playback programmes.

NOTE: This switch should be turned to the "V" normally, except adjusting a TV receiver.

Main Switch

This is the main power switch for the recorder. Use the recorder normally in the ON position of the switch. Set it OFF when the recorder is not used for a long period of time or if trouble occurs.

VIDEO IN Connector

This connector accepts a standard 1.0-volt p-p, 75-ohm video signal from a camera or other video source for recording. Use a coaxial cable with a BNC type plug for this connection. The VIDEO IN Connector can be used when the INPUT SELECT switch is turned to the LINE position.

VIDEO OUT Connector

The video signal being recorded or played back is available at this connector for monitoring. The output level is 1.0-volt p-p into 75 ohms. Use a coaxial cable with a BNC type plug for this connection.

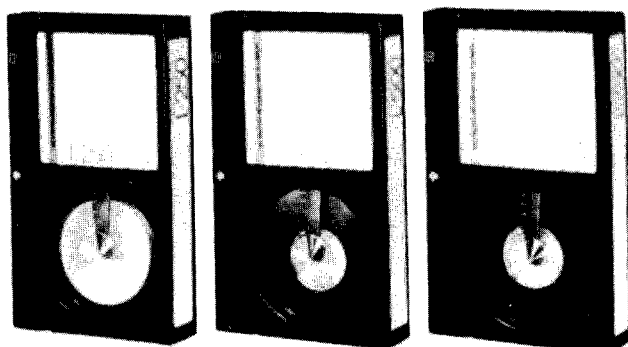
AUDIO IN Connector

When recording audio signals from the audio line output terminal of other equipment or another VCR, connect the line here. If nothing is connected, a TV programme selected by CHANNEL Button is recorded.

AUDIO OUT Connector

Audio signals being recorded or played back are available from this connector. Connect it to the audio input terminal of a video monitor or the auxiliary input terminal of an audio amplifier, or the line input of a cassette deck.

THE VIDEO CASSETTE AND ITS CARE



Recording & playback time

L-250	: 65 minutes
L-500	: 130 minutes
L-750	: 195 minutes

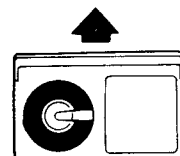
Dimensions: 96(W) x 25(H) x 156(D) mm

The Video Cassette is a precision engineered twin-reel cassette containing high performance video recording tape. Designed for use with NEC Video Cassette Recorder/Players, the BETAformat Cassette provides both the convenience of automatic tape loading and protection of valuable recorded contents. With reasonable care, you may expect many hours of high quality video programme enjoyment.

HOW TO USE CASSETTE

- * Like an audio cassette, the Cassette may be re-recorded many times. However, unlike an audio cassette, the Cassette can be recorded in one direction only, because the full width of the video tape is used to record picture and sound.
- * To start the operation of your Recorder, the cassette should be properly loaded in the recorder's Cassette Loading Door. Insert the cassette, label side up, into the Cassette Loading Door in the direction indicated by the arrow.

Direction of loading

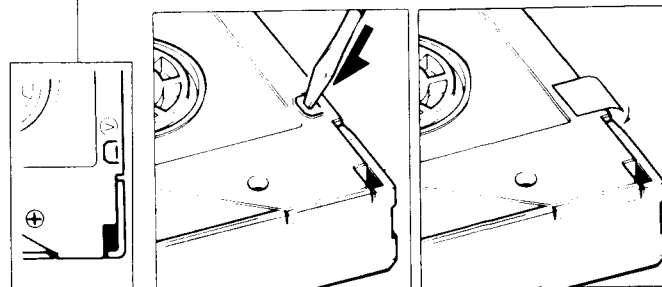
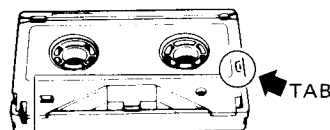


This side up for recording



Incorrect

- * For your convenience, a set of index labels is included with the Cassette. Placement of the label is indicated on the label card.
- * To protect your valuable recordings from accidental erasure, remove the tab located on the back side of the cassette. To re-record, simply cover the opening from which the tab was removed with adhesive tape.

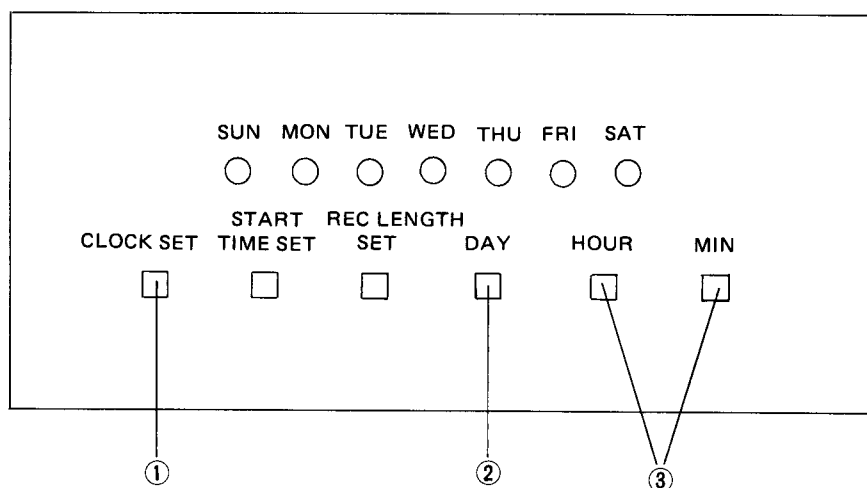
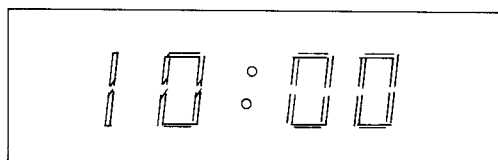
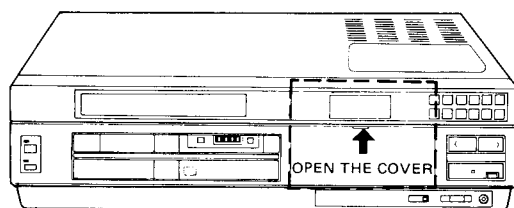


CARE OF THE CASSETTE

- * Do not use or store the Cassette in a hot or humid environment. Be especially careful not to expose it to direct sunlight, heating equipment or electrical devices which emit a strong magnetic field. If the cassette has been exposed to cold temperatures, it should be stored at room temperatures for at least one hour before use.
- * It is important that the protective tape shutter be kept closed at all times and that you do not touch the video tape, as the fingerprints may affect the operation of the video cassette recorder.
- * For maximum protection of the Video Cassette against dust or accidental damage, it is suggested that the cassette always be stored in its protective jacket when not in use.
- * The Video Cassette is a precision device. Do not attempt to disassemble the plastic case. This may result in a malfunction of the cassette and damage to the video cassette recorder. In the event the cassette fails to function properly, repairs should be made only by NEC authorized service personnel.

SETTING THE CLOCK

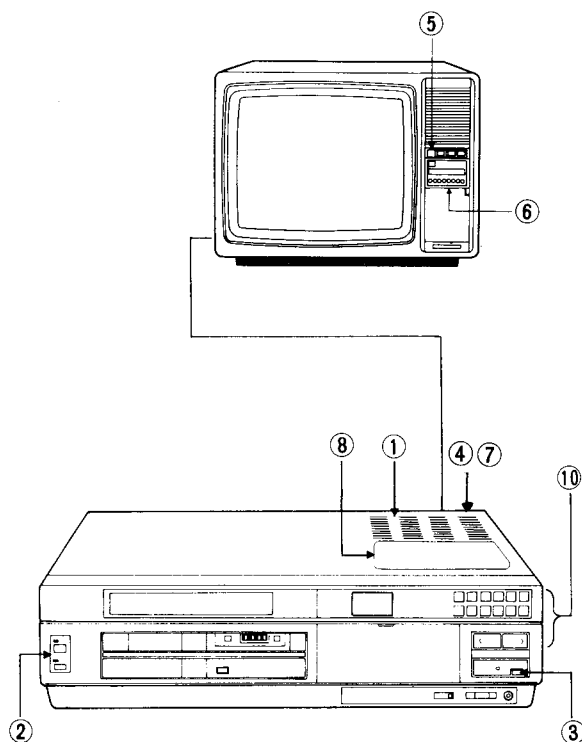
Connect the video cassette recorder to the power supply and turn the Main Switch ON.



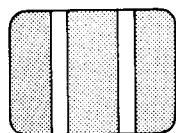
- ① Push Clock SET button and keep it on until the end of the time setting procedure.
- ② Push the DAY button repeatedly until the desired indicator lights.
- ③ Push then repeatedly until the desired time appears.
- ④ When the CLOCK SET button is released, the clock starts operating.

RECORDING TV PROGRAMMES

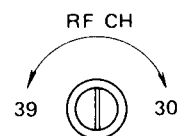
A. TV ADJUSTMENT



- ① Connect the VCR to a mains supply and switch on the main ON/OFF switch.
- ② Push the POWER switch to turn on the recorder.
- ③ Push the VIDEO/TV select button so that the green VIDEO lamp will light.
- ④ Set the TEST/V switch in the ANT. Terminal Board to TEST.
- ⑤ Turn on the TV.
- ⑥ Adjust one of the unused program selectors of the TV to the range of the RF unit output channel — between UHF E30 and E39 — until a black and white pattern is clearly displayed on the TV screen.



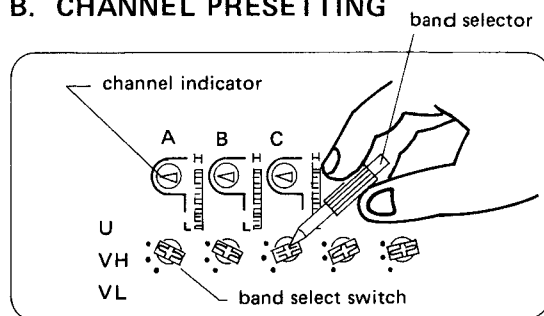
● If the test picture is not free of disturbance, push the VIDEO/TV button (the green lamp goes off). If there are interference signals or even a TV program on the TV screen, select an inactive channel between E30 and E39 on the TV where the picture tube shows only snow and the loudspeakers give out a steady rustling sound. Then press the VIDEO/TV button (the green lamp lights) again, and turn the screw of the RF CH selector at the rear slowly with screwdriver until the black and white pattern appears on the TV screen.



- ⑦ Reset the TEST/V switch to V position.

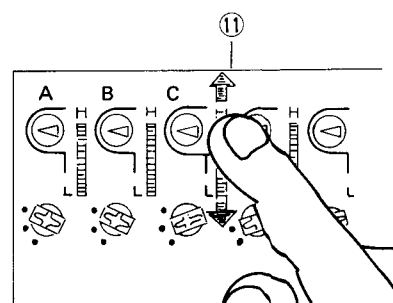
NOTE: If a recorded Beta format video cassette is available, you can tune the TV while playing back the cassette. Insert the cassette and push the FWD button. Then tune the TV until the cassette program is clearly displayed on the TV screen and the sound can be heard clearly. Now the TV has been correctly tuned to receive the output signals of the RF unit.

B. CHANNEL PRESETTING



⑨ ⑬

AFT
ON
OFF



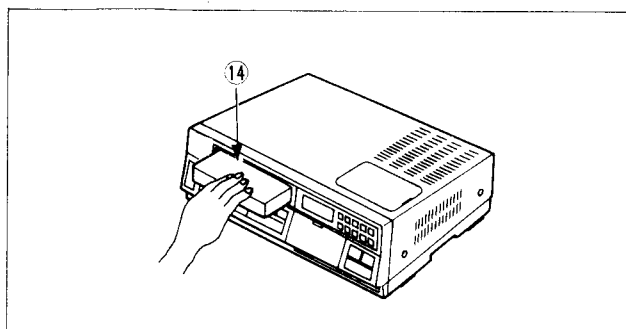
H: for higher-numbered channels
L: for lower-numbered channels

- ⑧ Open the channel preset compartment.
- ⑨ Set the AFT switch to OFF.
- ⑩ Push the channel UP or DOWN button until the desired channel indicator light up.
- ⑪ Turn the tuning knob until the desired station is properly tuned in. The channel indicating meter provides a visual indication of the approximate location of the tuning control. When the picture appears, slowly turn the tuning knob to the right until a herringbone pattern appears in the colored part of the picture, then turn the knob back until the herringbone pattern just disappears and the picture is clear. If the sound cannot be heard clearly, perform the fine adjustment of the channel on the TV side.
- ⑫ Repeat steps ⑩ and ⑪ for the other channels.
- To identify the channels, consult a newspaper or TV program guide.
- ⑬ Set the AFT switch to ON when all stations have been set up as desired.

C. LOADING THE VIDEO CASSETTE

⑭ Load a Cassette.

Before loading, carefully check that the anti-erase tab on the cassette rear surface is not broken, then insert the cassette. If the tab is broken, video recording is not possible.

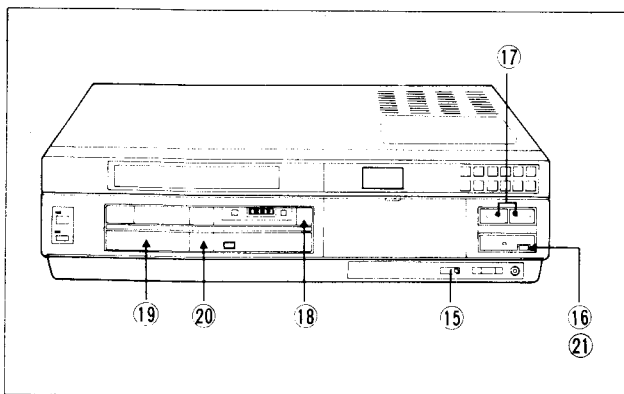


D. PROGRAMME MONITORING

⑮ Set the INPUT SELECT switch to TUNER.

⑯ Set the VIDEO/TV switch to VIDEO green lamp lights up.

⑰ Choose a recording programme using the channel selector button on the VCR.



E. RECORDING

⑱ Push the RECORD button. Record lamp (red) lights up and recording starts. If the safety tab on the cassette rear is broken, the cassette is ejected at this time.

⑲ To stop recording, push the STOP button.

F. PROGRAMME EDITING

⑳ To avoid recording unwanted material during recording, press the PAUSE/STILL button. Note that the PAUSE/STILL indicator lights to indicate that the unit is in the pause mode.

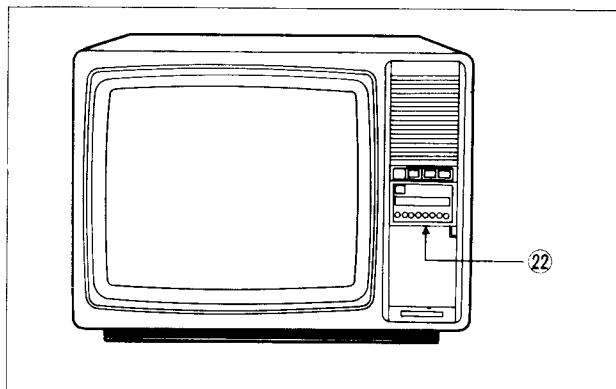
Please note that the pause mode should not be continued for more than three minutes in order to avoid unnecessary tape wear. Press the PAUSE/STILL button again to resume recording.

NOTE: The video recorder will automatically stop if the pause mode is continued for about 5 minutes. This is to protect the tape from damage.

G. VIEWING ONE TV CHANNEL WHILE RECORDING ANOTHER CHANNEL

㉑ Set the VIDEO/TV switch to TV.

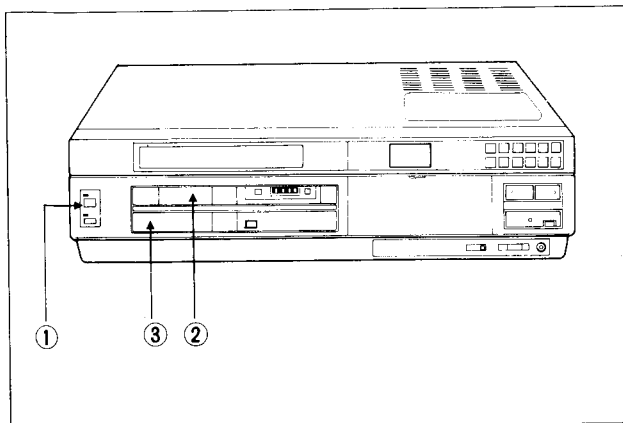
㉒ Tune the TV receiver to the channel to be watched.



MC-Service

PLAYBACK OF A PRE-RECORDED CASSETTE

A. PLAYBACK



- ① Turn ON the POWER switch and load a cassette.
- ② Push the FWD button. Then, the playback picture from the video cassette appears in a moment. (VIDEO/TV switch is automatically set to VIDEO)
- ③ Push the STOP button to stop playback.

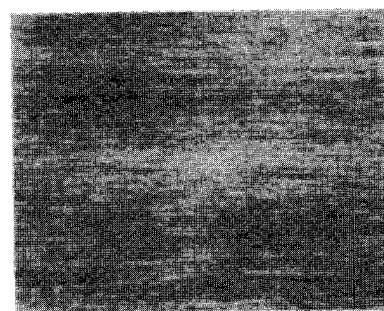
B. TRACKING ADJUSTMENT

● Adjustment of the video head tracking is normally required only when playing back video cassettes recorded on another recorder. Mistracking is indicated when a narrow band of horizontal noise appears in the picture (as shown in the illustration). In this case, a perfect noise-free picture may be obtained by rotating the TRACKING control to the right or left as required. When video cassettes are recorded and played back on the same machine, the TRACKING control should be kept in the mid (notch) position for optimum picture quality.



C. SHOULD SNOW OR STREAKS APPEAR

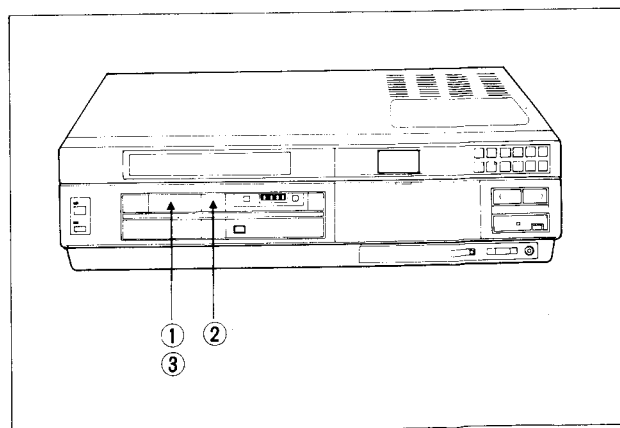
- The appearance of snow or streaks in the playback picture may indicate the need for cleaning the video heads inside the recorder. Should the need for head cleaning be suspected, consult the dealer from whom the recorder was purchased.



D. FORWARD PICTURE SEARCH

- ① Push the FWD button to set the playback mode.
- ② To watch the picture at a quick speed in a forward direction during playback, push the F.FWD button.
- ③ To reset the playback mode, push the FWD button once again.

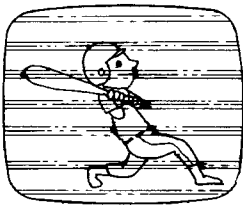
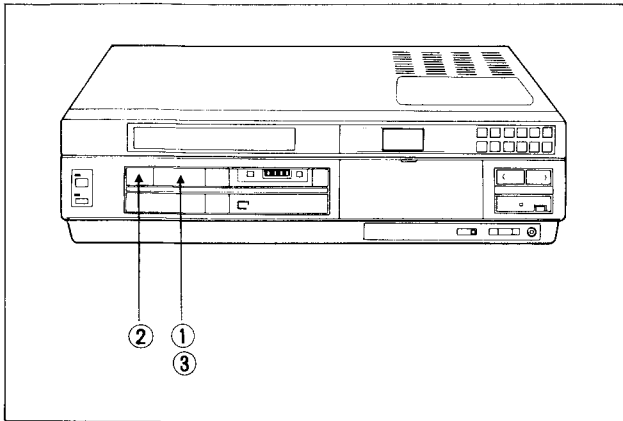
Forward picture search is also set by pushing the F.FWD button during reverse picture search.



E. REVERSE PICTURE SEARCH

- ① Push the FWD button to set the playback mode.
- ② Push the REW button during playback, then the playback picture appears at a fast speed in the reverse direction.
- ③ To reset the playback mode, push the FWD button once again.

Reverse picture search is also attained by pushing the REW button during forward picture search.

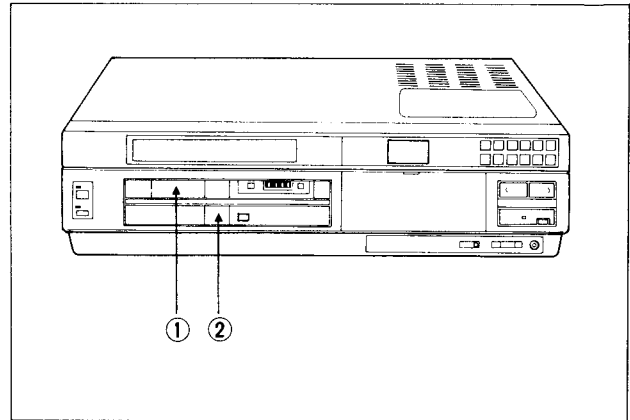


- Several streaks may sometimes appear but this is not a malfunction.
- When the picture rolls vertically, adjust the V.HOLD of TV set.
- Picture search does not work during recording.
- Sound can not be heard during picture search.

F. PAUSE

- ① Set the playback mode by pushing the FWD button.
- ② Push the PAUSE/STILL button, then a still image is visible. Push the PAUSE/STILL button once again, then the original playback mode is reset.

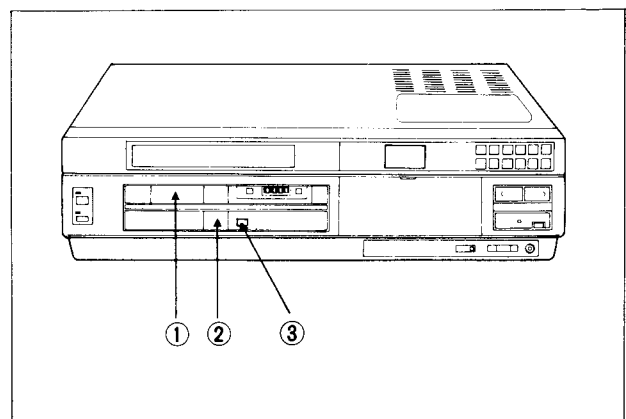
* A pause is automatically released after about 5 minutes and the recorder is reset to the original mode.



G. STILL Adjust

- ① Set the playback mode by pushing the FWD button.
- ② Push the PAUSE/STILL button, then a still image is visible.

Push the STILL Adjust button, for adjusting noise bar position.



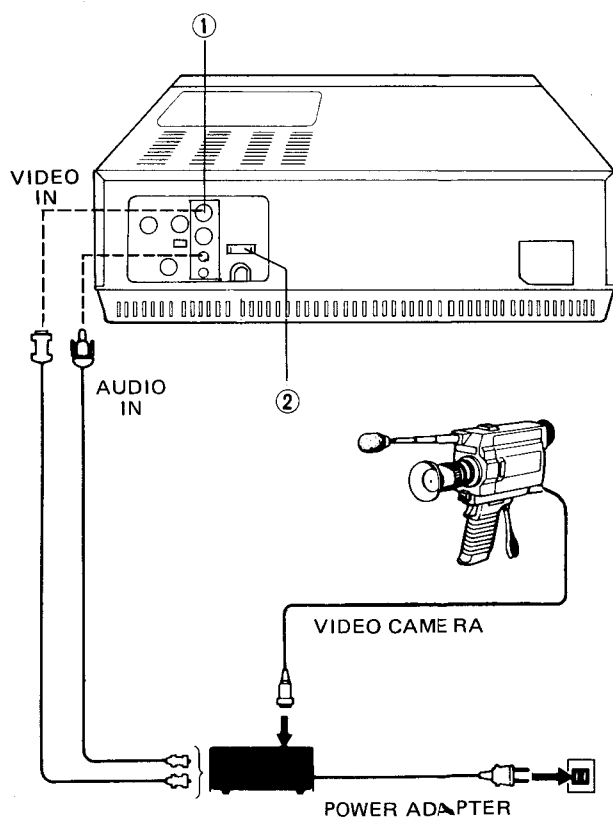
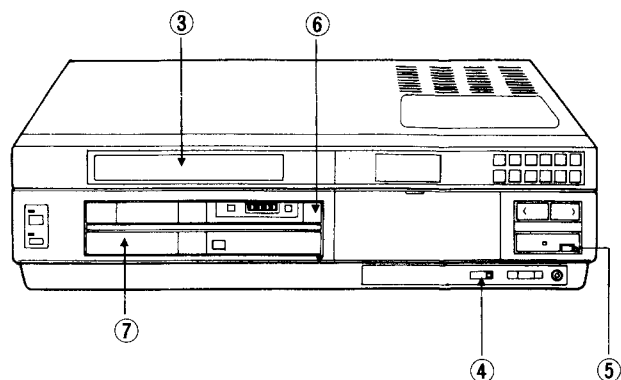
RECORDING WITH A VIDEO CAMERA

* For best results, it is recommended that a camera with an internal 2:1 interlace should be used for video recording.

- ① Connect a camera to the VIDEO IN connector using a BNC-type connector.
- ② Turn ON the MAIN switch and Power switch of the VCR.
- ③ Load a Cassette.
Before loading carefully check that the anti-erase tab on the cassette rear surface is not broken, then insert the cassette.
If the tab is broken, recording is not possible.
- ④ Set the INPUT SELECT switch to LINE.
- ⑤ Set the VIDEO/TV switch to VIDEO.
- ⑥ Push the RECORD button.
Record lamp (red) lights up and recording starts. If the safety tab on the cassette rear is broken, the cassette is ejected at this time.
- ⑦ To stop recording, push the STOP button.

NOTES:

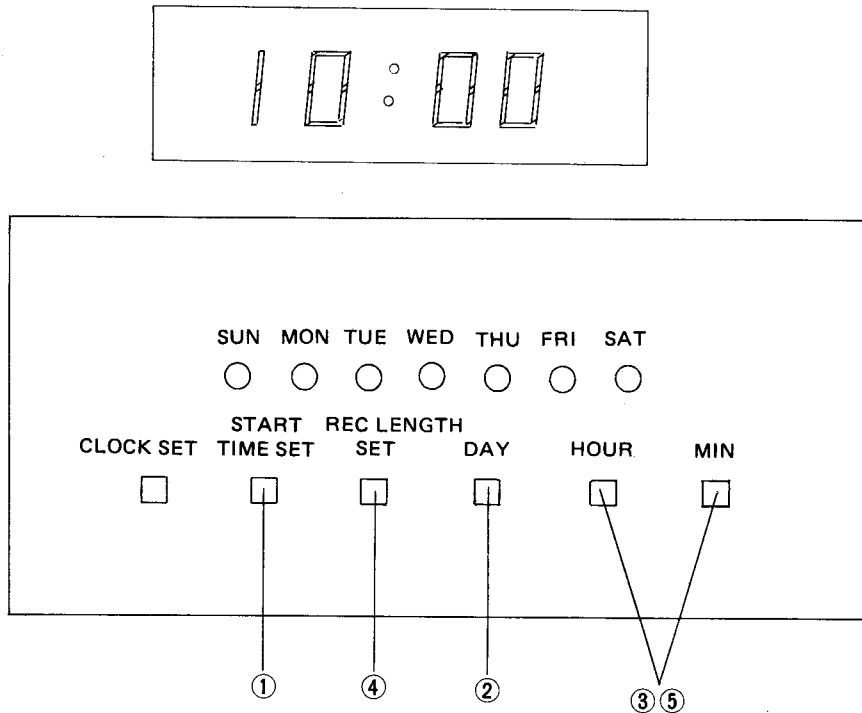
- Cameras must conform to CCIR TV standards.



TIMER RECORDING (unattended)

1. How to set the time recording

Set recording DAY, REC START TIME and REC LENGTH, as desired.

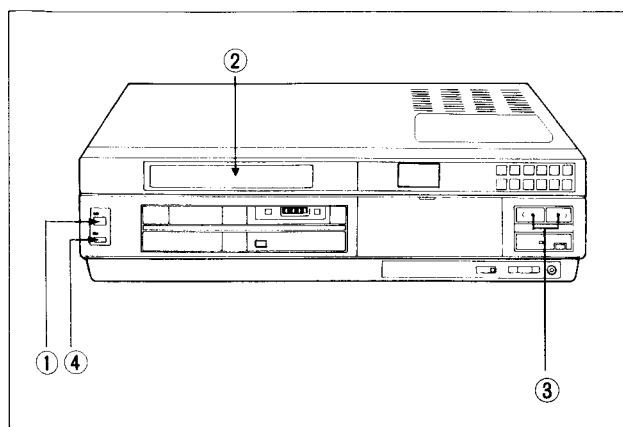


- ① Depress the START TIME SET button and keep it on until the end of the time setting procedure.
- ② Push the DAY button repeatedly until the desired indicator lights.
- ③ Push the HOUR button for hour-digit setting, and MIN button for minute-digit setting repeatedly until desired time appears.
- ④ Depress the REC LENGTH SET button and keep it on until the end of the time setting procedure.
- ⑤ Push the HOUR button for hour digit setting, and MIN button for minute digit setting, repeatedly until the desired time appears. Be careful not to forget setting the REC LENGTH. If it is not set, a recording will not be made.

MC-Service

2. How to record using the timer

After setting the timer reservations, prepare timer-record by the following method.



- ① Turn ON the VCR POWER switch.
- ② Load a cassette tape. Before doing this, carefully check that sufficient tape remains for timer-recording.
- ③ Set the TV channel to be recorded.
- ④ Turn POWER switch to ST-BY, then turn on the TIMER REC button. Then, the timer lamp lights up. If the safety tab is broken, the timer lamp will not light up. If this happens check the cassette.

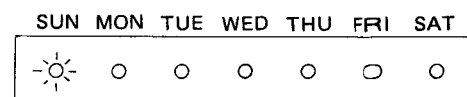
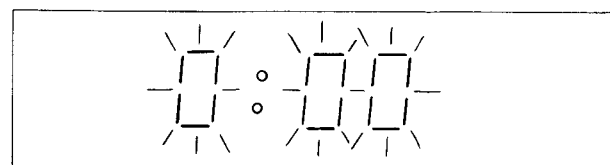
- When, the timer-reserved time comes, timer-recording starts. Simultaneously with the start of timer-recording, the REC LENGTH start to be subtracted by running time.

3. Precautions for time use

- During timer recording, each operation (stop, pause, etc.) will not work. To operate any of these functions, push the POWER switch ON. If the POWER switch and STOP Button are pushed during timer recording, the microprocessor judges that timer recording has finished. Therefore, when turn POWER switch to ST-BY once again, then the power supply is on, but the recorder returns to a stop mode and keep it stop until it goes for the specified REC LENGTH.

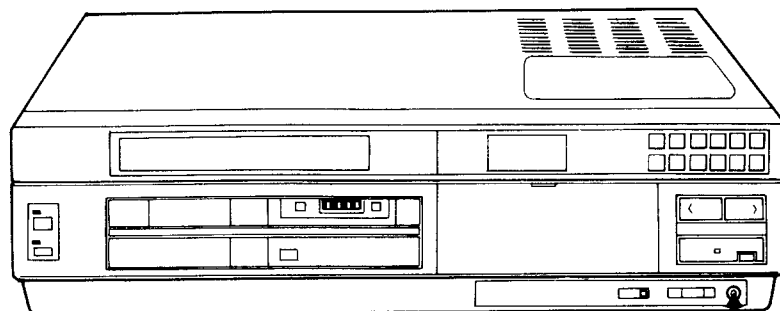
Power Failure Warning

If the power failure, DAY and TIME flicker at about one sec. intervals. During this flickering, the contents of PRESENT TIME and PROGRAM SET are cleared, so correct them according to page 8.



USING THE REMOTE CONTROL UNIT

With the use of the Remote control unit, you can command F.FWD, FWD, REW, STOP, REC, PAUSE/STILL, STILL ADJUST and PICTURE SEARCH away from the recorder. The function of the controls on the remote control unit is the same as on the VCR.



Connect the cable from the Remote Control Unit to the Remote control connector.

REW/REV PICTURE SEARCH Button

This button is used for both rewind and reverse search. Press this button for high speed tape rewind. Press this button during the playback mode for soundless, high speed colour picture playback.

This is convenient for visually scanning back to any desired position on the tape. Press the FWD button to return to the standard playback mode.

PAUSE/STILL Button

Stops the tape movement in the record or playback mode.

During recording, press this button to avoid recording unwanted material. Press again to resume normal recording.

During playback, press this button for still picture viewing. Press again to resume normal playback.

STILL ADJUST Button

During still, press this button for adjusting noise bar position.

FWD Button

When this button is pressed, the FWD indicator illuminates and the prerecorded video cassette is played back.

F.FWD/FWD SEARCH Button

This button is used for both fast forward and forward search. Press this button for high speed tape advance and, used with the tape COUNTER, for fast location of programme material. Press this button during the playback mode for soundless, high speed colour picture playback.

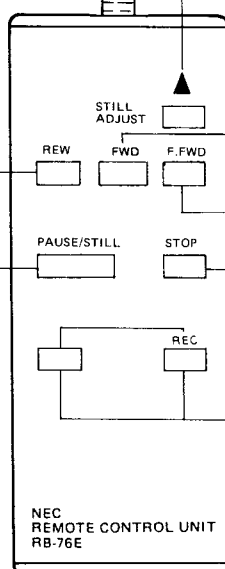
This is convenient for scanning through unwanted programme material or for visually locating the beginning of a programme. Press the FWD button to return to the standard playback mode.

STOP Button

When this button is pressed during operation, the tape stops moving and all functions are interrupted.

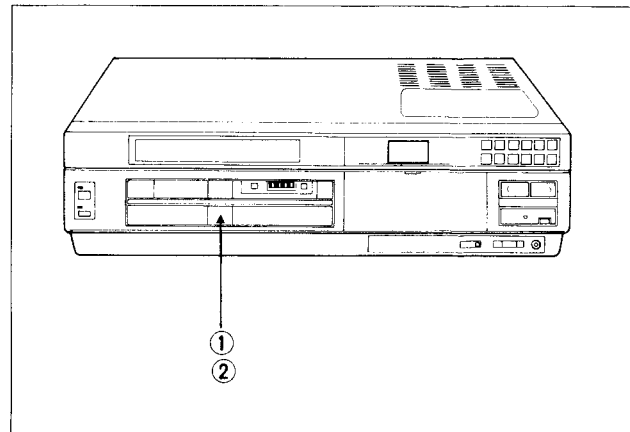
RECORD Button

When the recording button and safety button are pushed together, recording begins.



EDITING PROGRAMME MATERIAL

- ① To avoid recording unwanted material during recording, press the PAUSE/STILL button. Note that the PAUSE/STILL indicator lights to indicate "pause".
- ② To resume recording, press the PAUSE/STILL button again.



AUTOMATIC REWIND SYSTEM AND MEMORY COUNTER

The model PVC-766E includes an automatic rewind system which automatically rewinds the tape when it reaches the end in the recording, playback and fast forward modes (except in the timer mode). It is a good idea to use this function along with the memory counter.

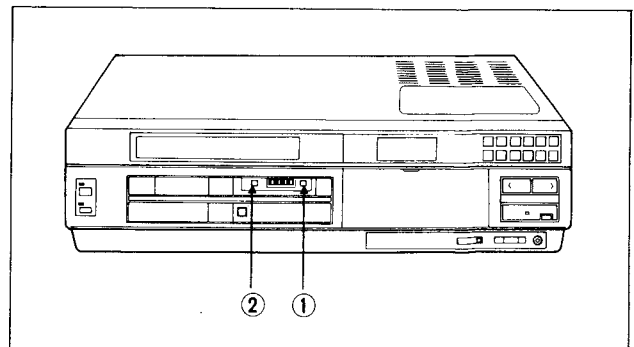
USING THE MEMORY COUNTER

The memory counter can be used to memorize the counter "0000" tape position. The video recorder will stop automatically when the counter reaches "0000" through "9999" while the tape is being rewound.

- ① Press the RESET button to reset the tape COUNTER to "0000".
- ② Press the MEMORY button in to the ON position.

NOTES:

- The memory counter works only in the rewind mode.
- The video recorder will stop when the counter indicates approximately "9999". To rewind the tape further, press the REW/PICTURE SEARCH button again.
- If the memory counter function is not used, the tape will be rewound to its start and the video recorder will be set to the stop mode.



WHEN THE DEW LAMP LIGHTS UP

When the VCR is abruptly moved from a cool area to warm area, condensation may form inside the unit. When this occurs, the indicator lamp lights up and, if a cassette tape is inside, it is automatically ejected. In this case, keep the power ON, and a dehumidifier works to remove the moisture automatically. Then, the lamp will go out to indicate readiness of operation.

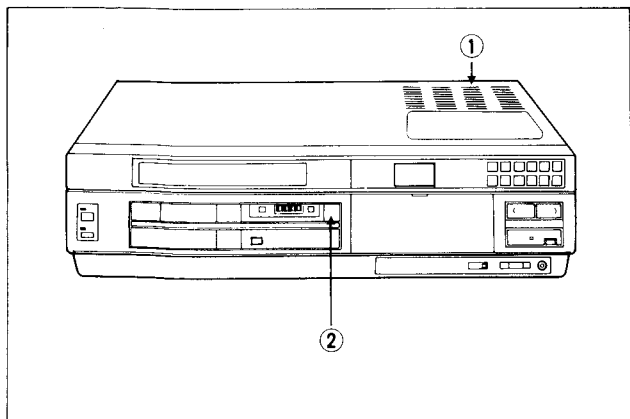
WHEN THE STOP LAMP IS FLICKERING

If trouble occurs during tape movement or to the mechanism inside the VCR, a safety device works to stop the operation of the VCR automatically to prevent damage to the tape. If this occurs turn OFF the main switch once and, after several seconds, turn it ON again to start. If the STOP lamp flickers again, request repair or maintenance from a NEC dealer.

TAPE ERASING

During the recording process, all video and audio information is automatically erased prior to the actual recording of the new video and audio programme. Therefore, to erase a tape without making a new recording, the following procedure can be used.

- ① Be sure that nothing is connected to the VIDEO IN and AUDIO IN connectors.
- ② Operate the recorder in the record mode.
- ③ Since there are no inputs, the tape will be erased and no new video and audio information will be recorded.

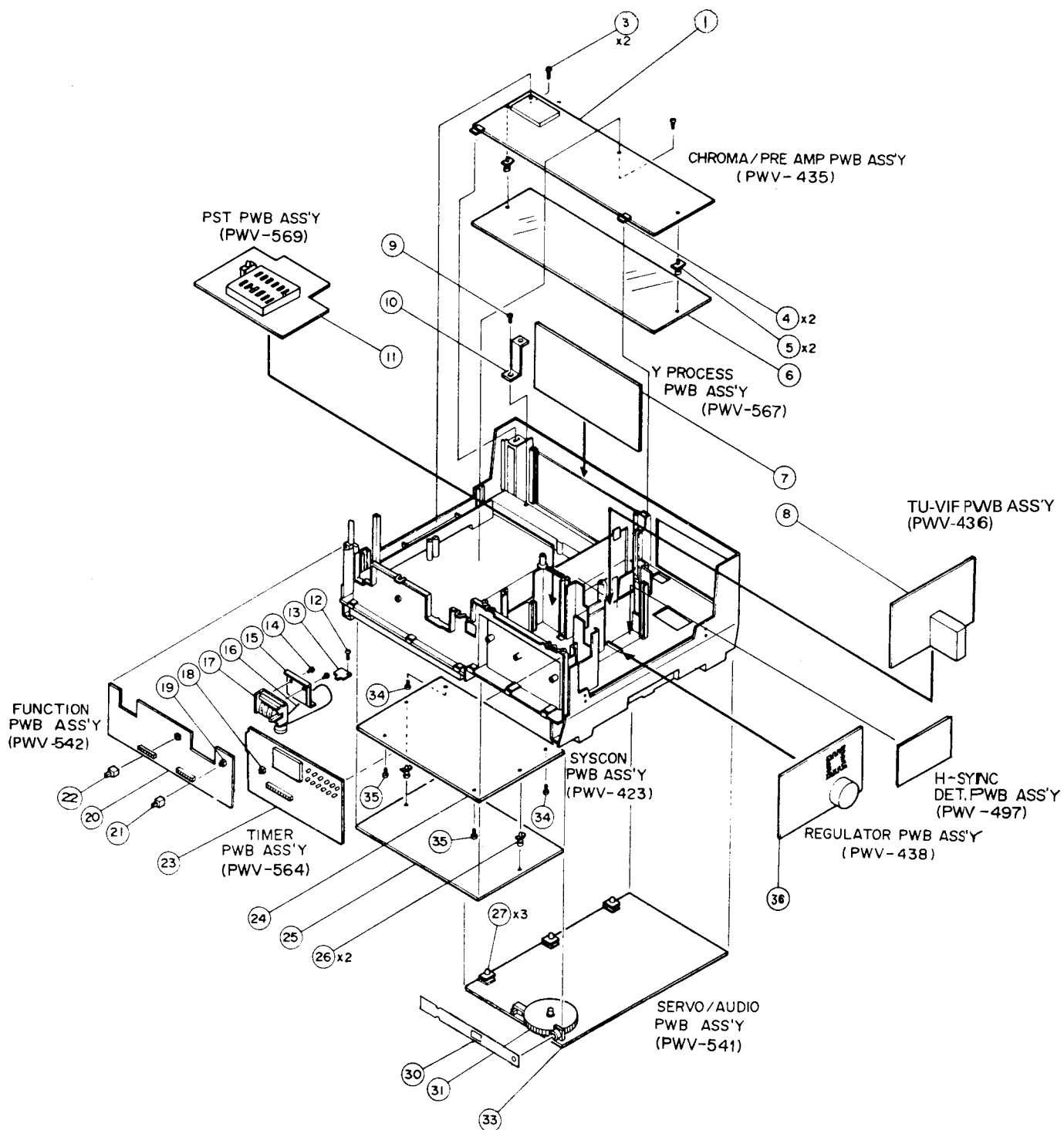


MAINTENANCE

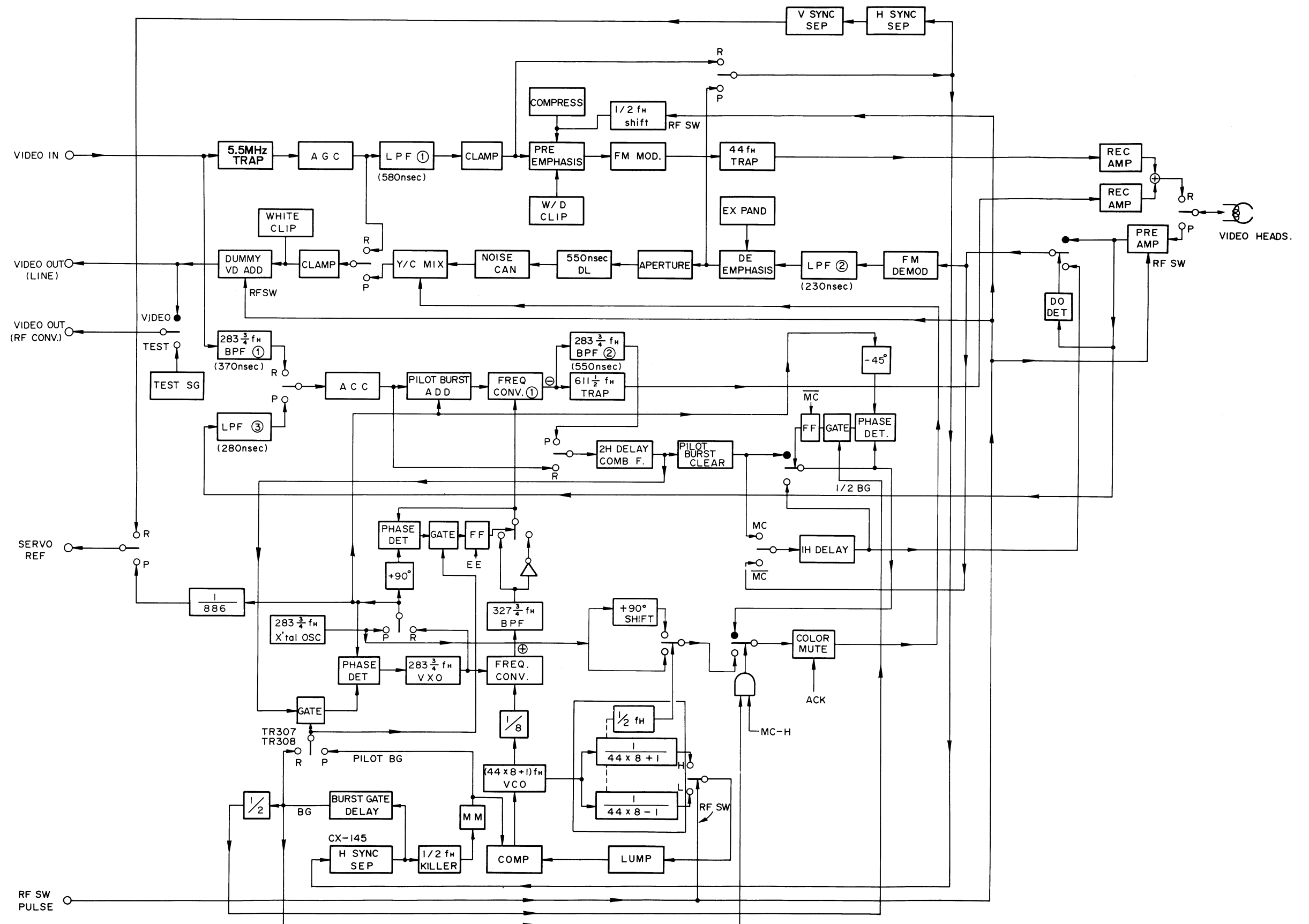
The PVC-766E is a precision instrument and, treated with care, will provide years of satisfactory performance. However, in the event of difficulties, the owner is advised not to attempt to make repairs or open the cabinet. Servicing should always be referred to your nearest NEC dealer.

MC-Service

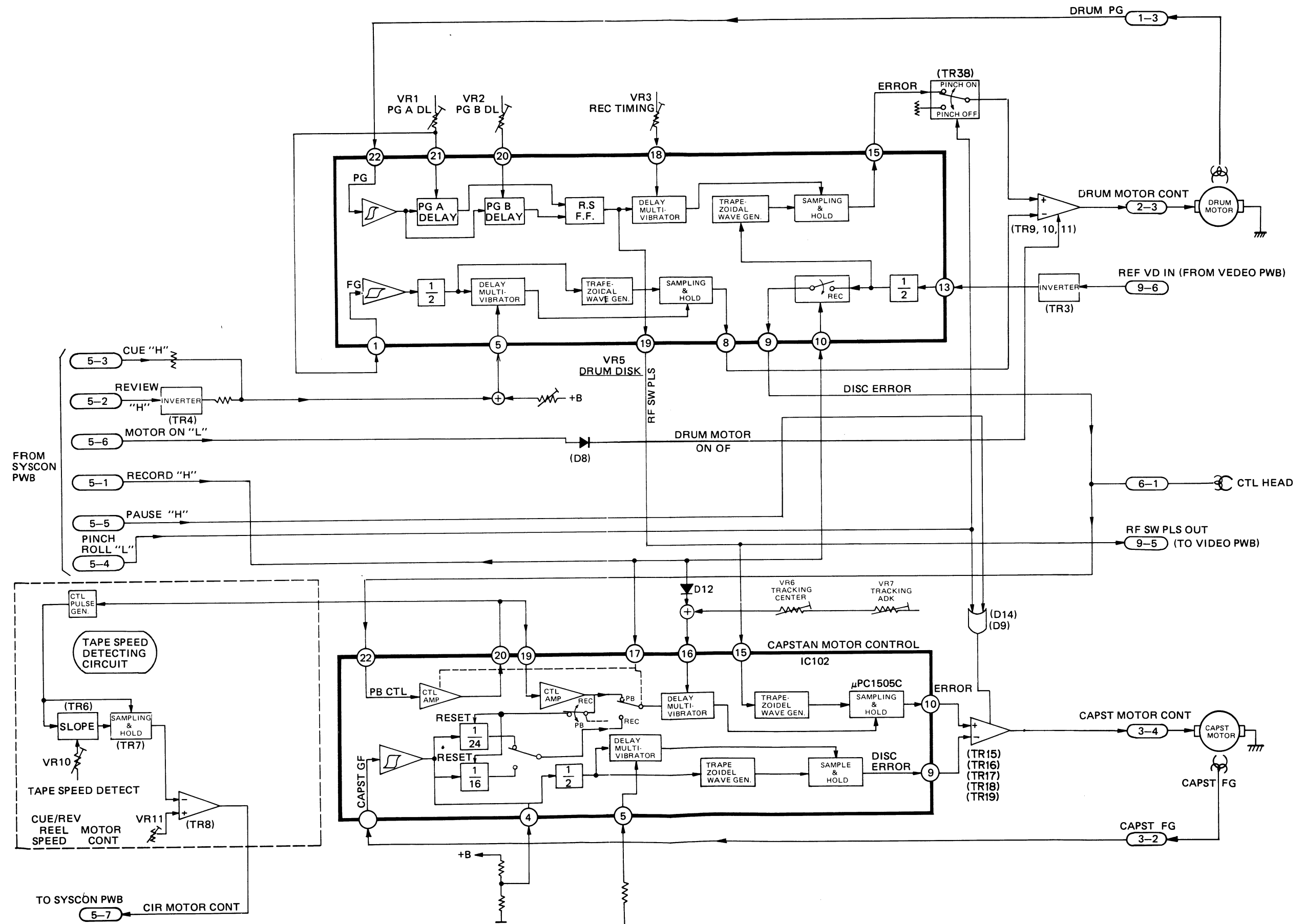
1-3. LOCATION OF PARTS AND CONTROLS



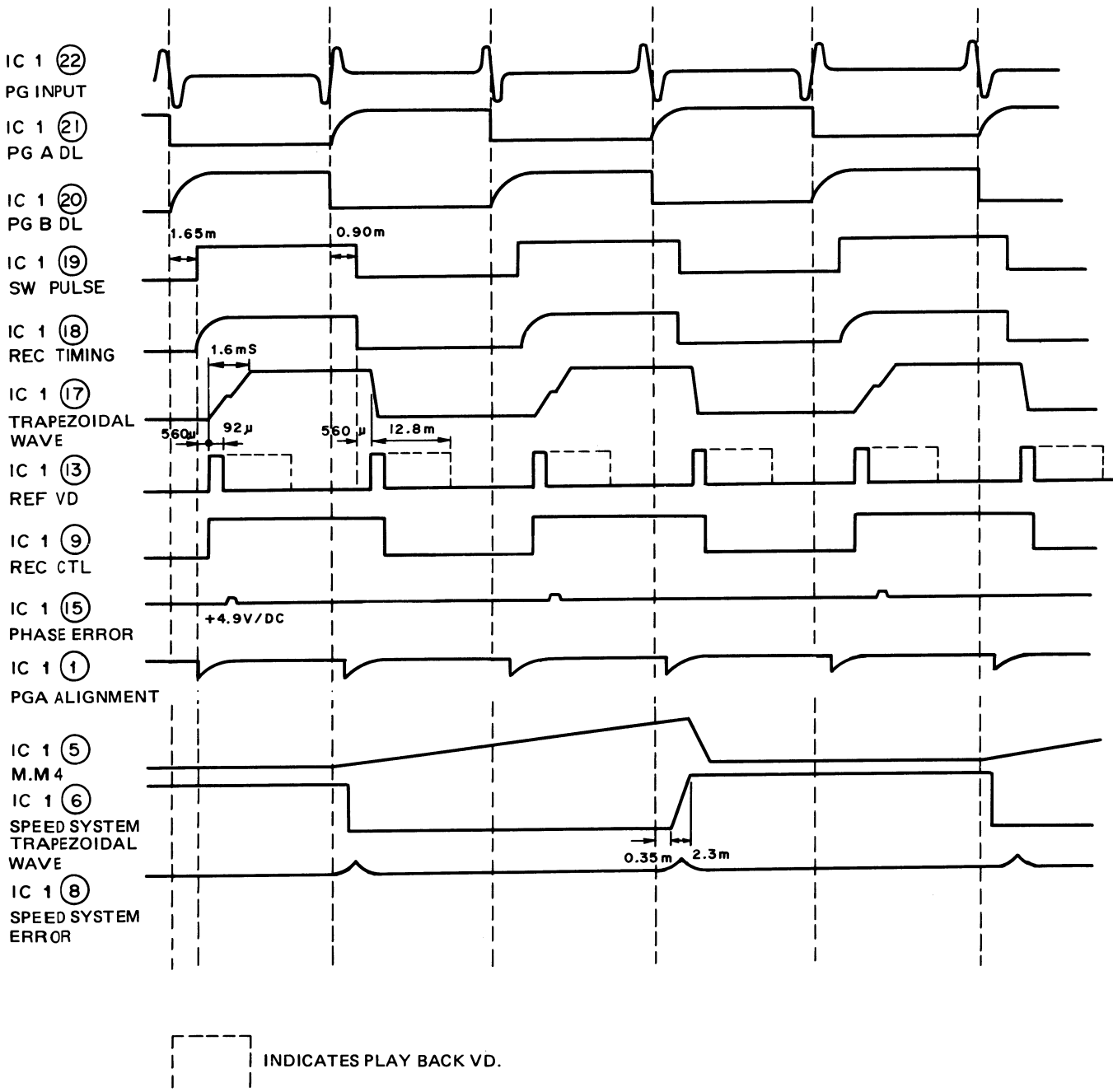
VIDEO SYSTEM BLOCK DIAGRAM



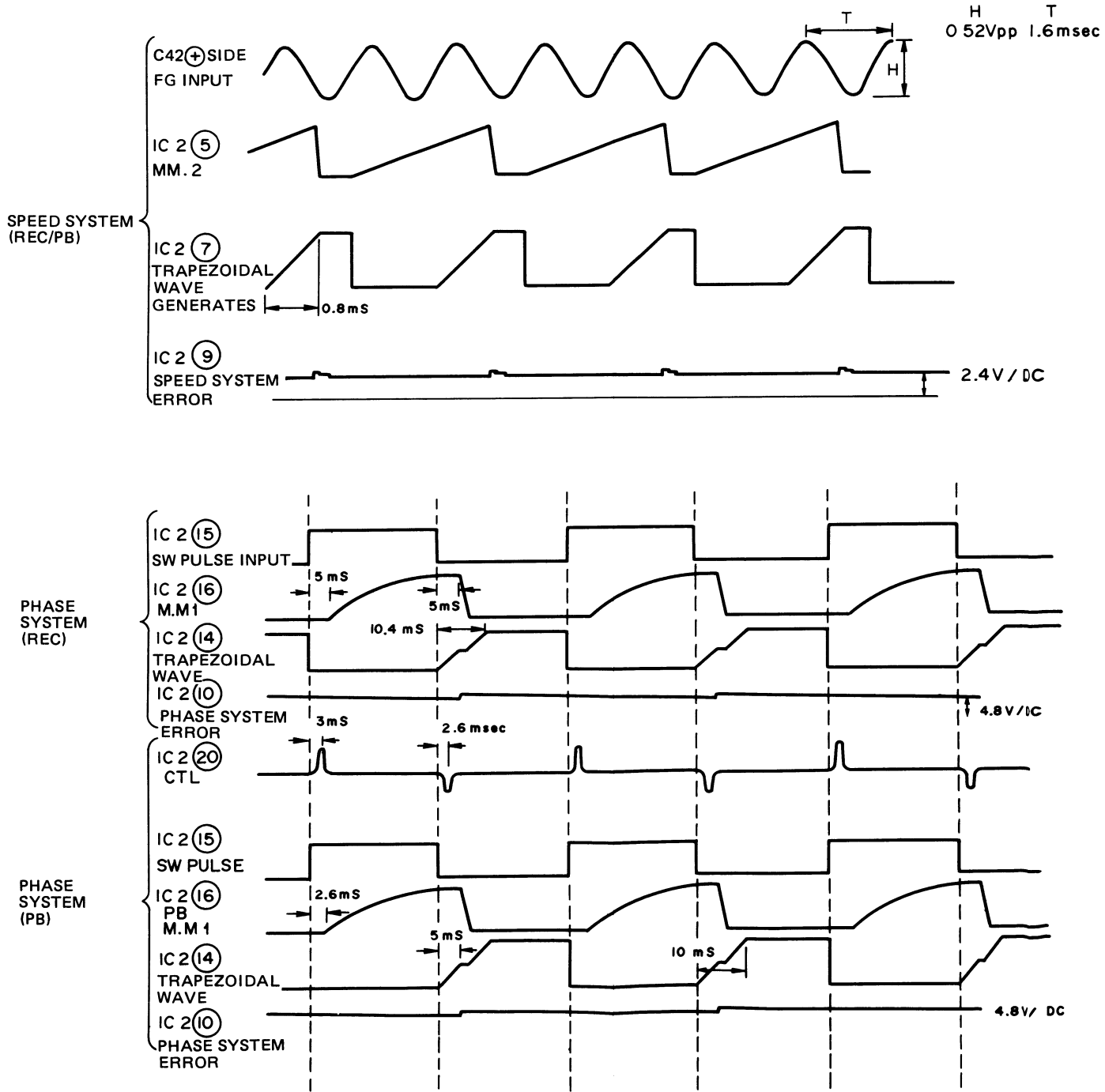
CAPSTAN & DRUM SERVO BLOCK DIAGRAM



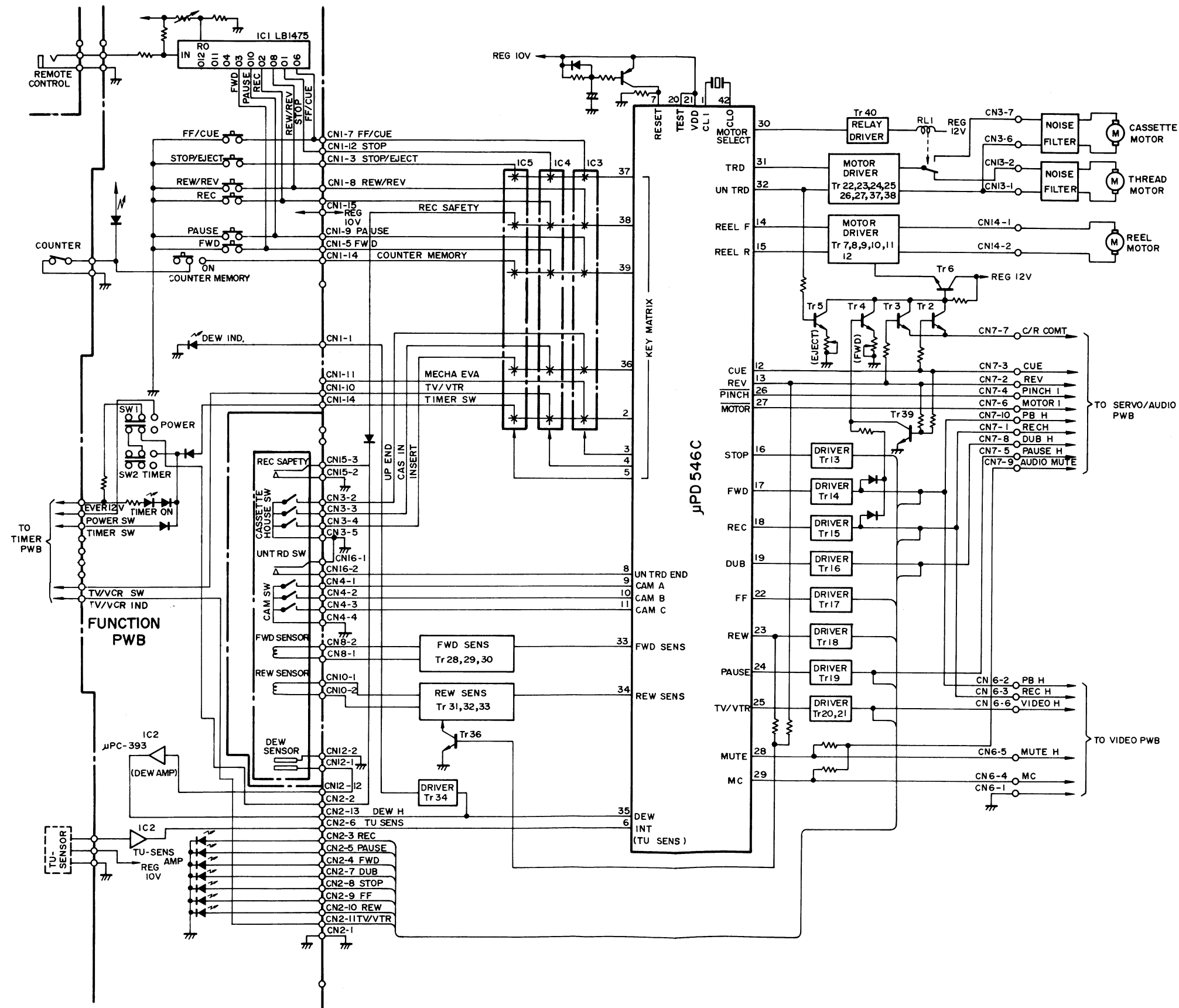
DRUM SERVO TIMING CHART



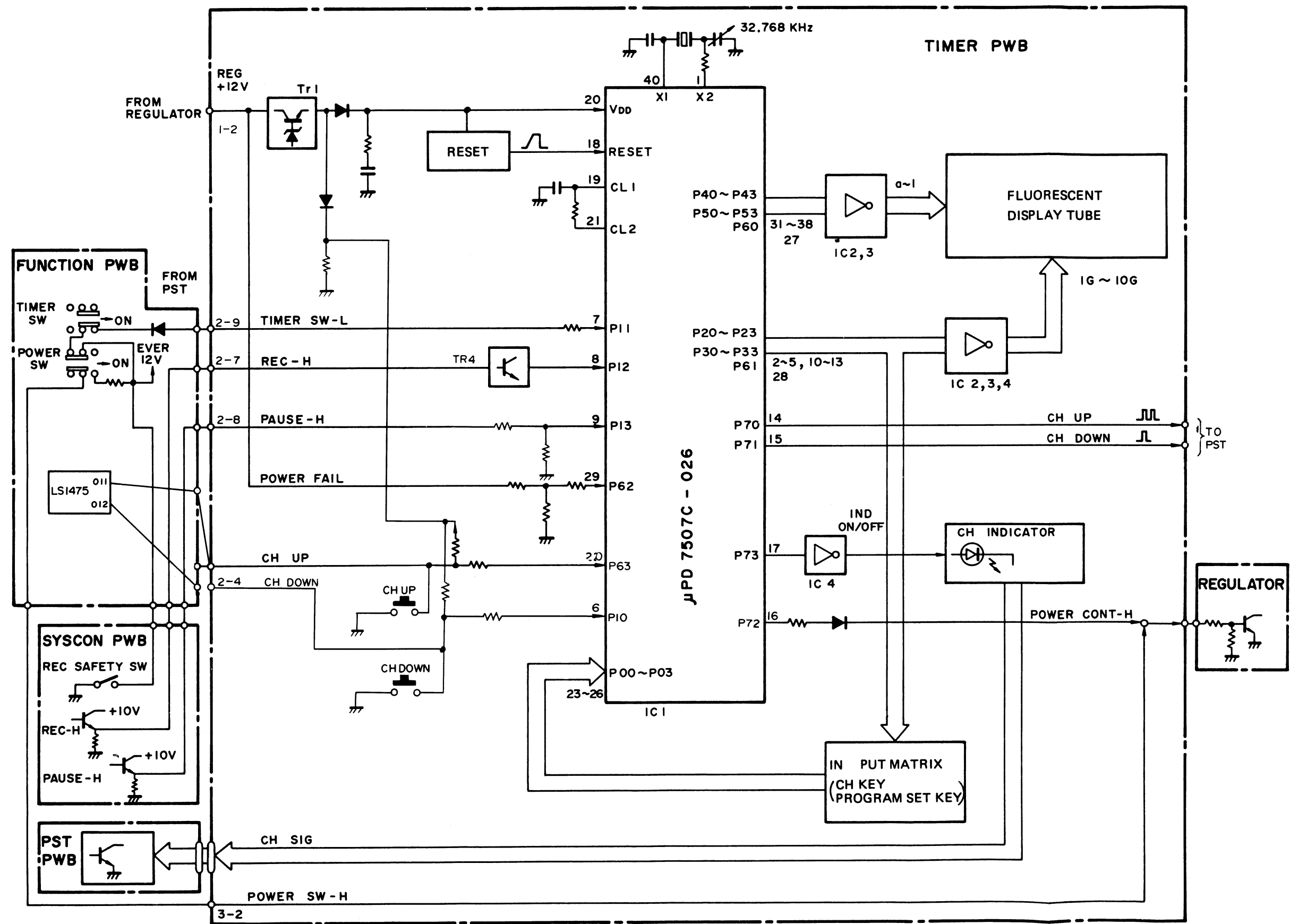
CAPSTAN SERVO TIMING CHART



SYSTEM CONTROL BLOCK DIAGRAM

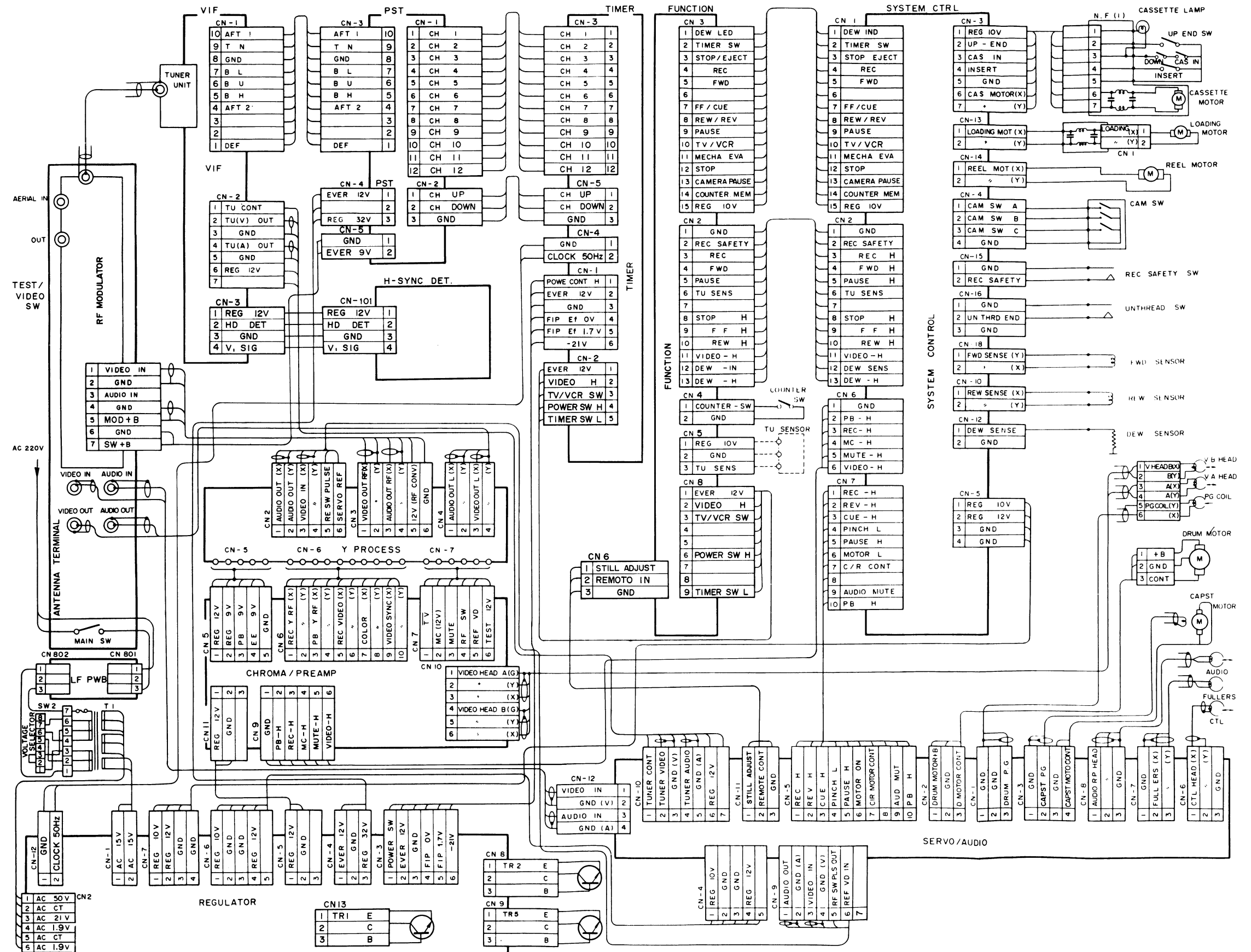


TIMER BLOCK DIAGRAM





FRAME WIRING

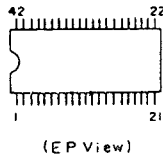


TRANSISTOR BASE CONNECTION

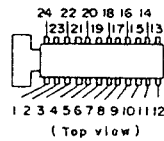
HD74LS93P
HD74LS74AP
HD74LS10P
HA1124



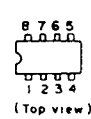
μPD546C-330



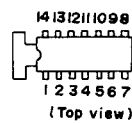
CX134A
CX136A
CX832



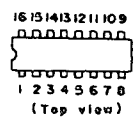
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μPC393C



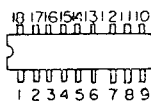
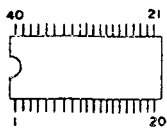
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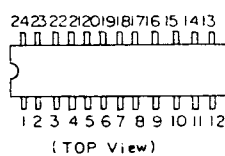
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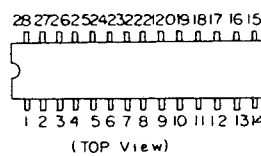
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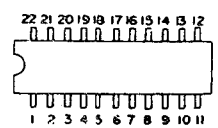
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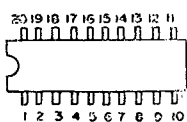
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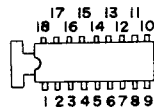
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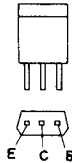
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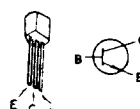
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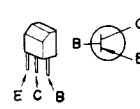
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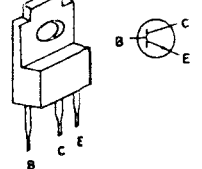
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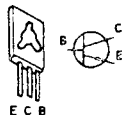
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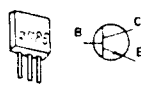
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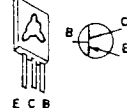
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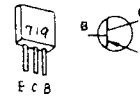
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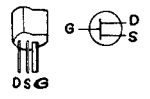
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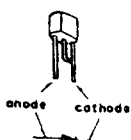
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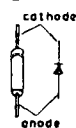
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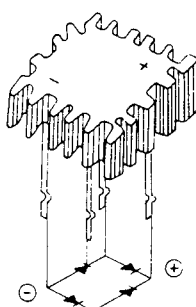
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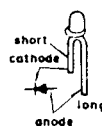
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RD 5.6V
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RD 9.1EB
RD 3.0EB
IS953
RD 10EB



D5FB10



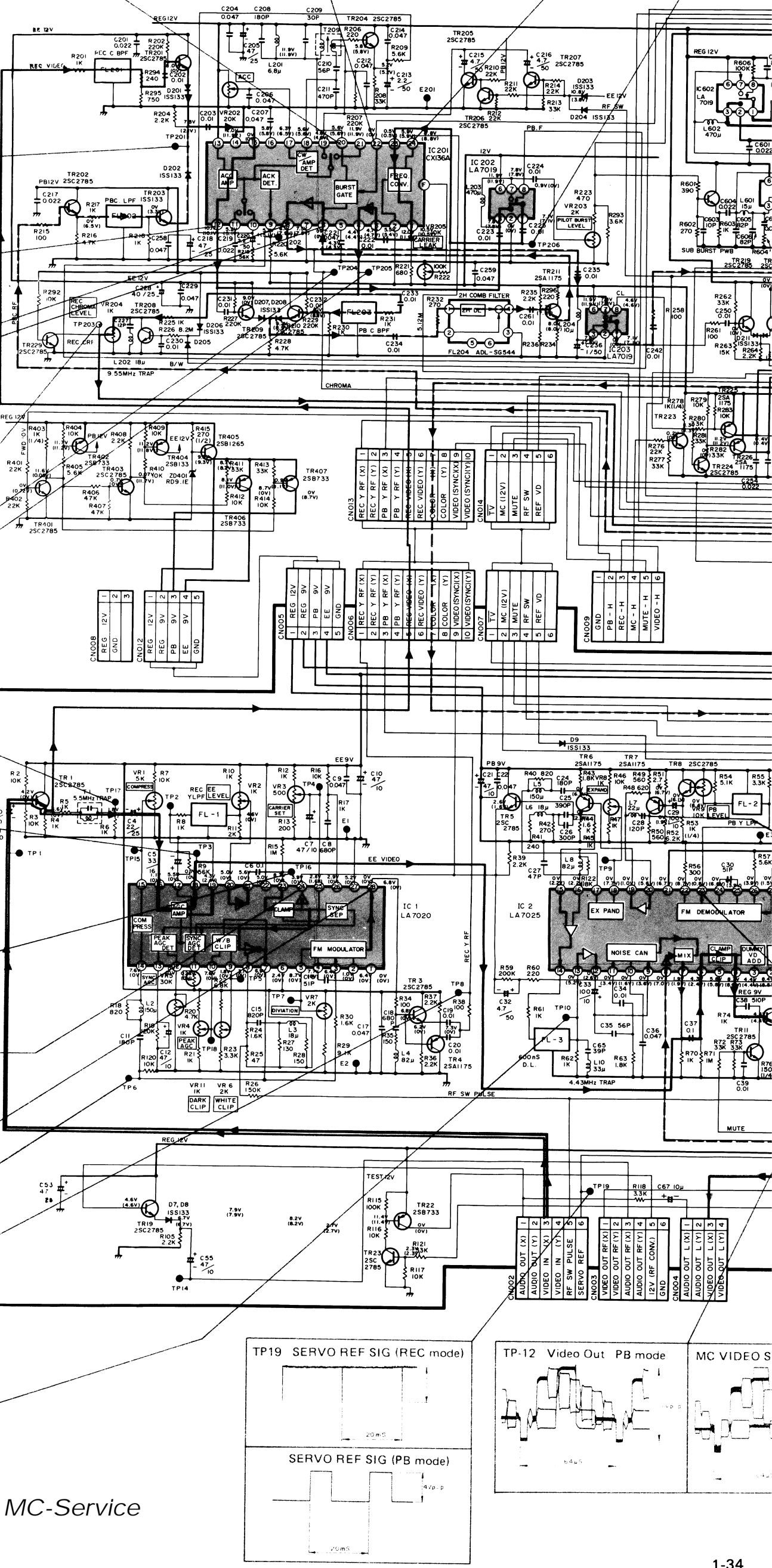
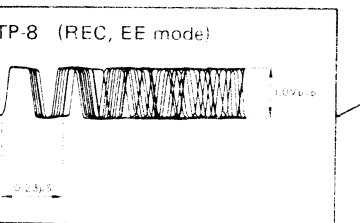
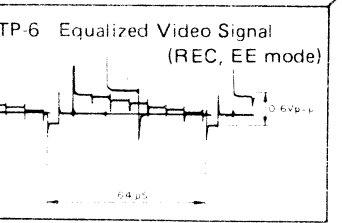
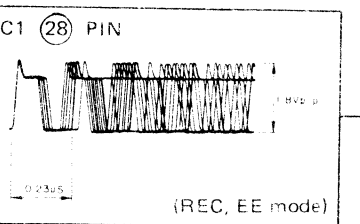
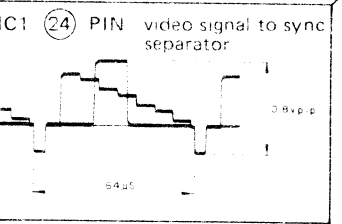
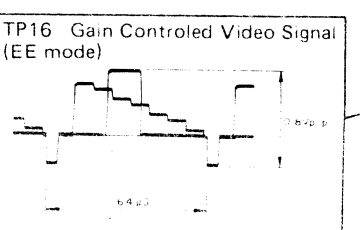
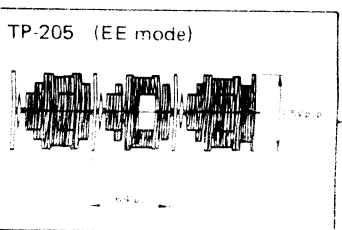
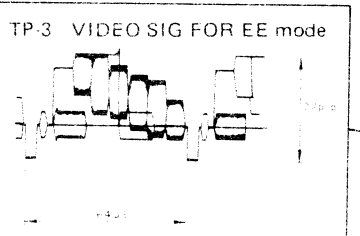
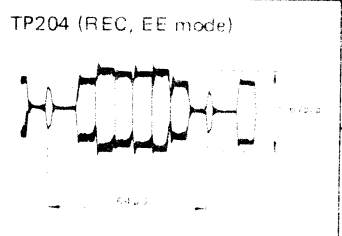
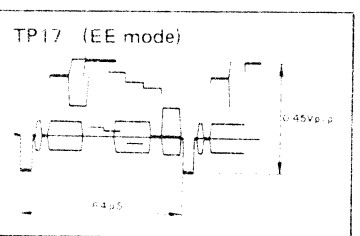
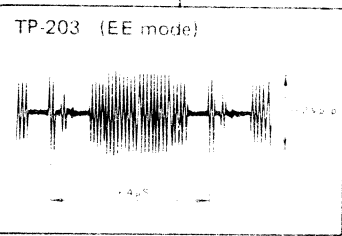
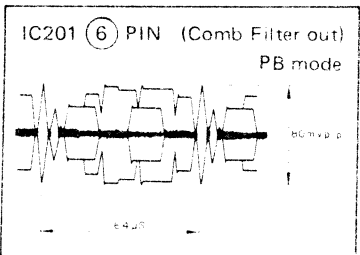
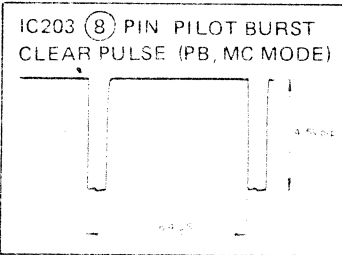
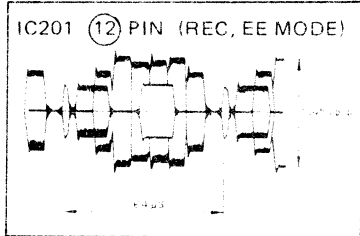
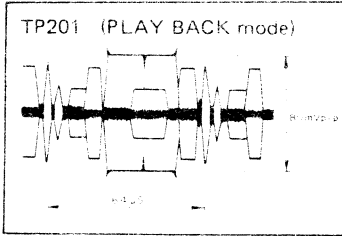
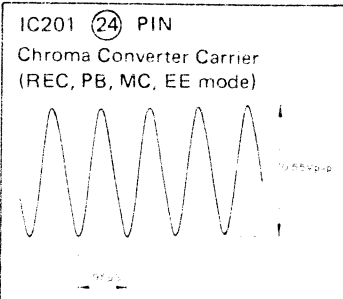
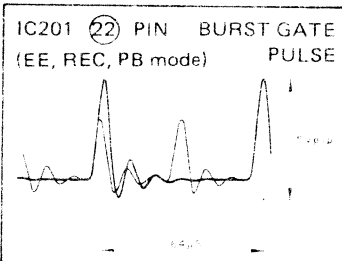
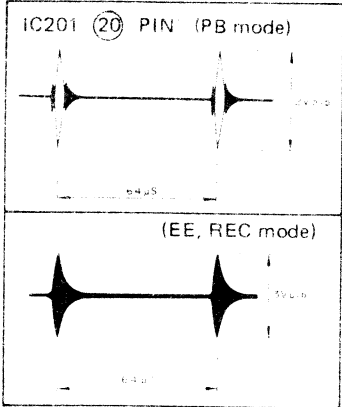
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TLR123A, TLR113A

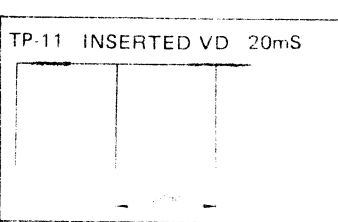
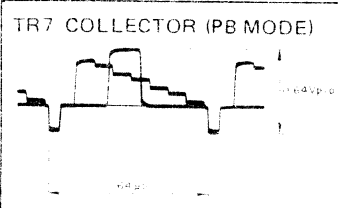
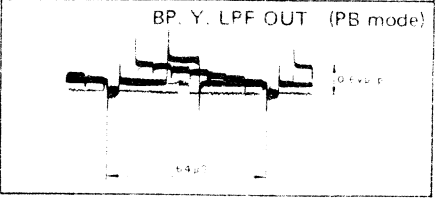
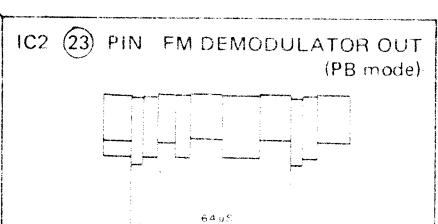
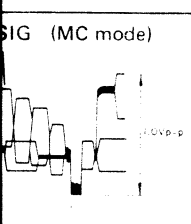
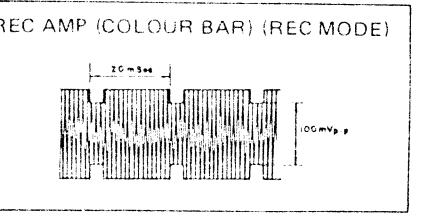
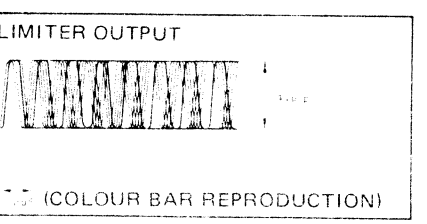
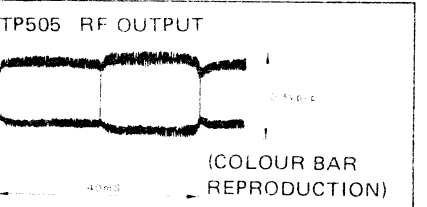
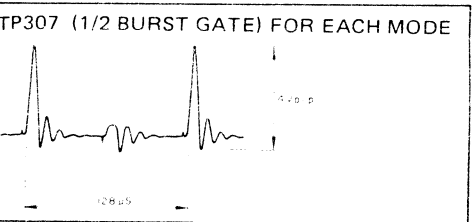
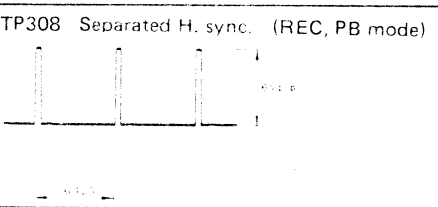
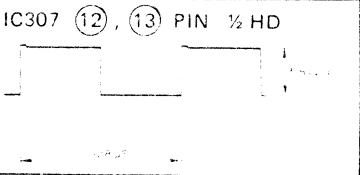
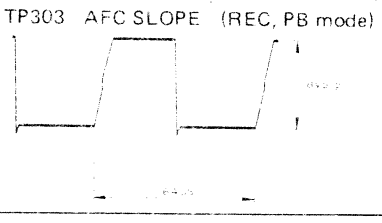
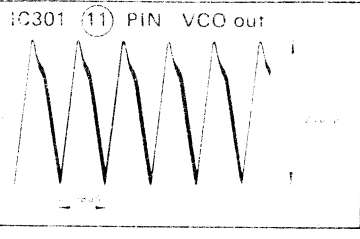
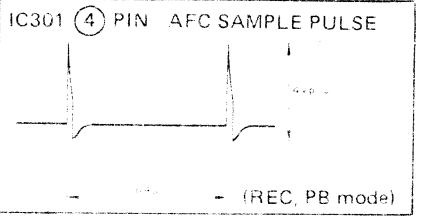
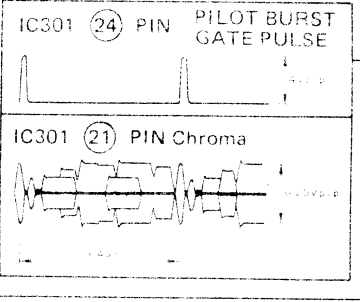
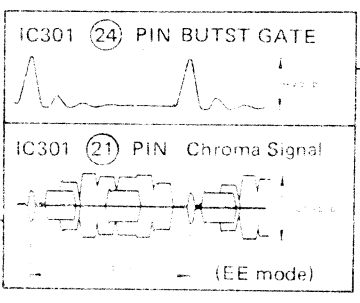
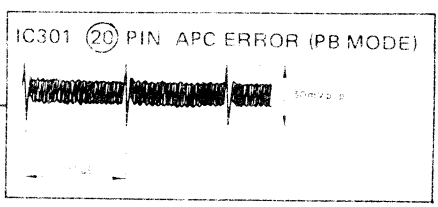
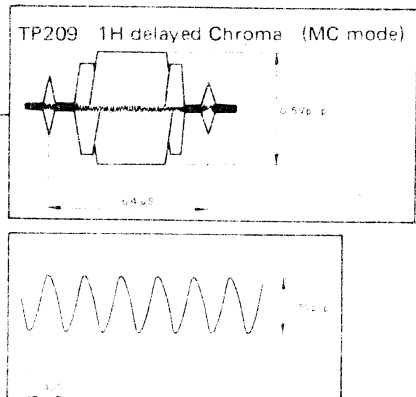
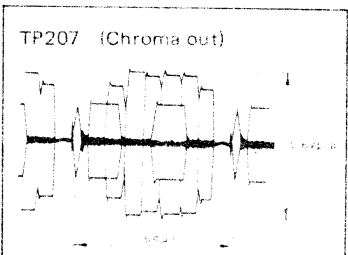
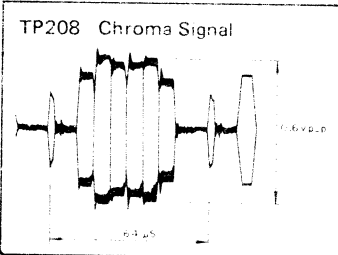
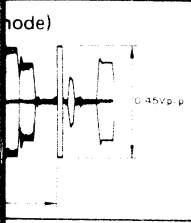
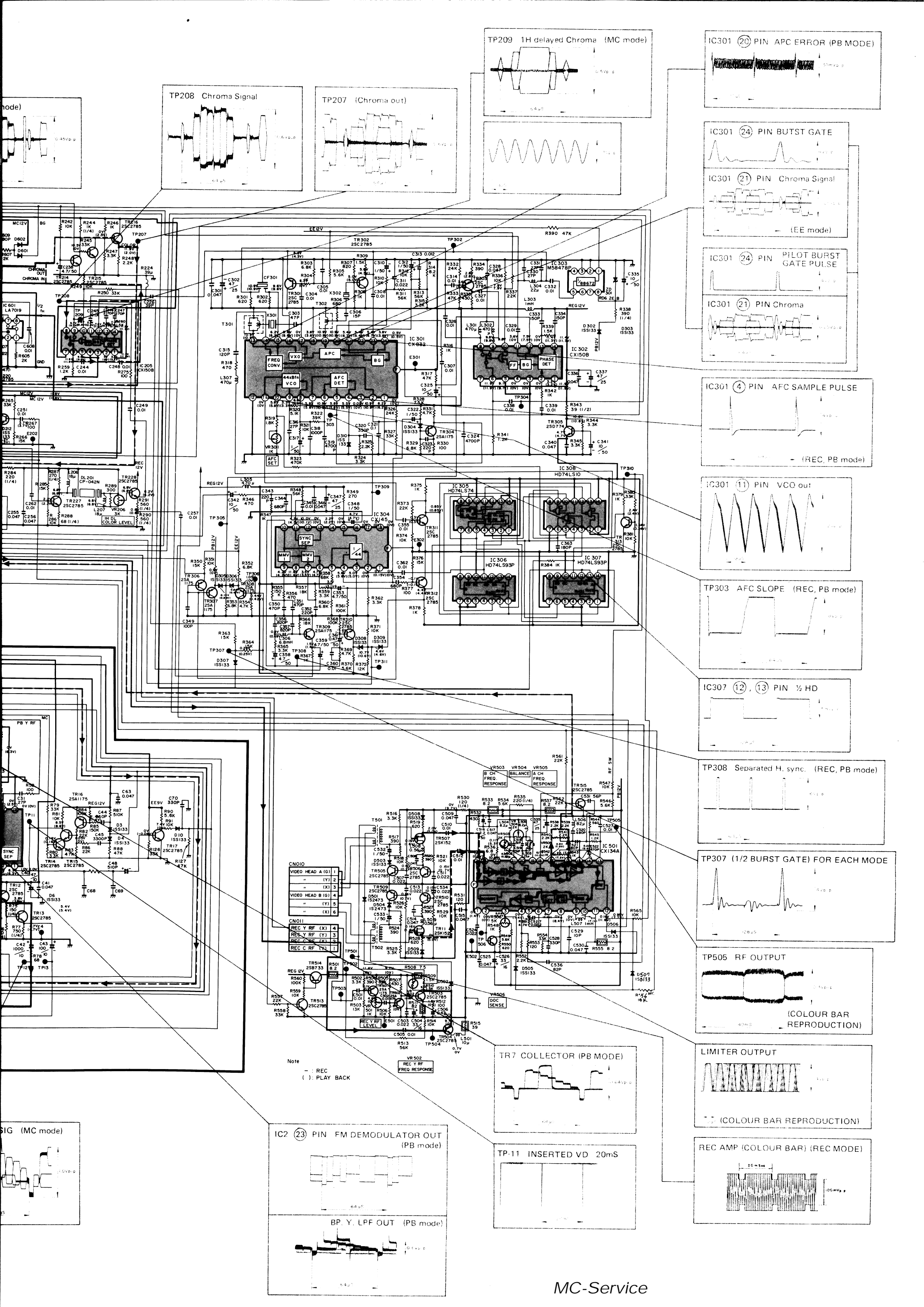


MC-Service

Y. PROCESS (PWV-434)/CHROMA
PREAMP (PWV-435) CIRCUITS

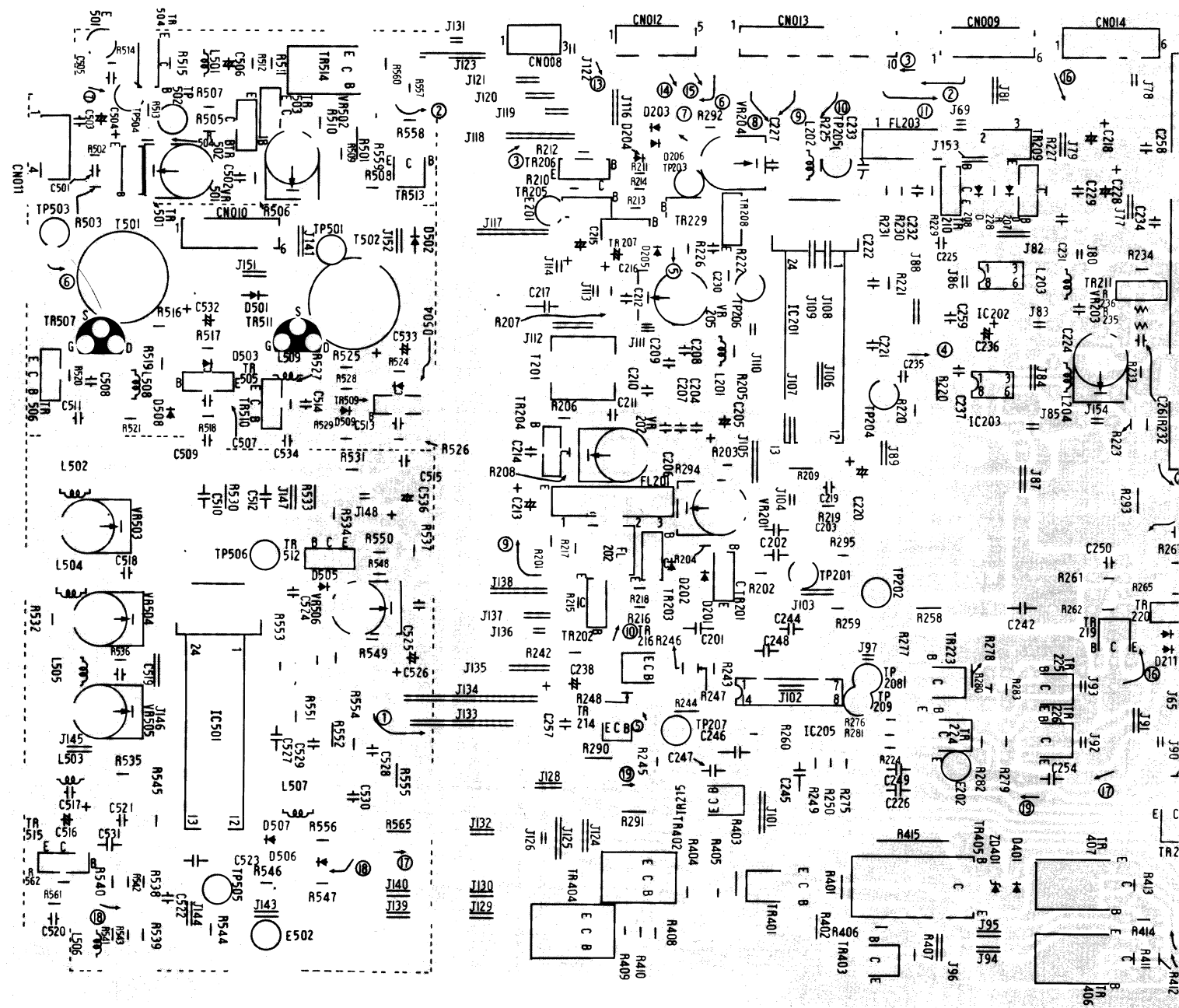
00. REC MODE
(00) PB MODE
- REC CHROMA
- - - PB CHROMA
- REC Y
PB Y
- EE SIG
- - - PB COMPOSITE



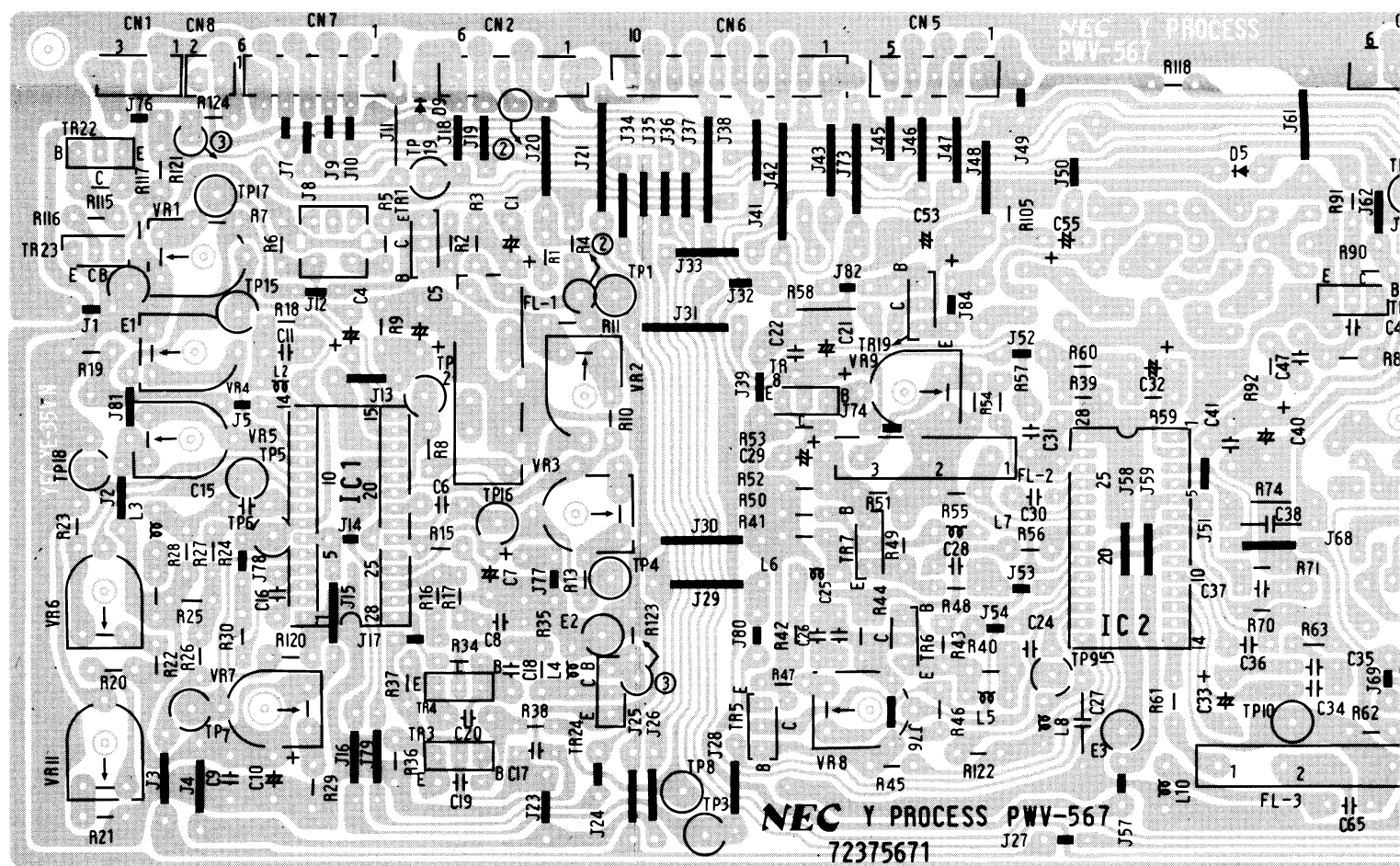


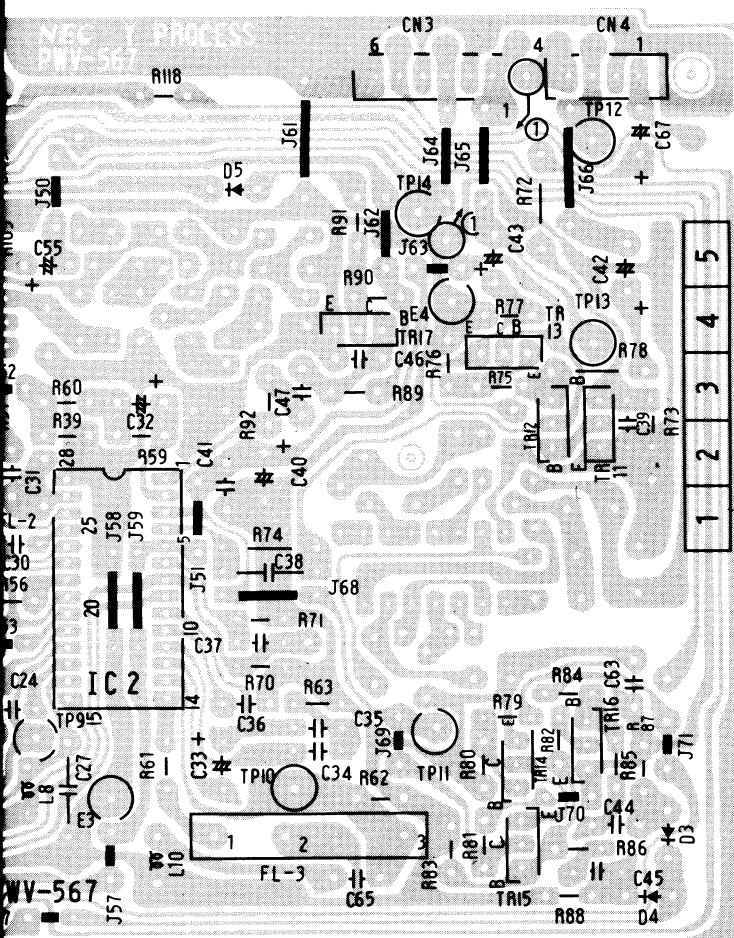
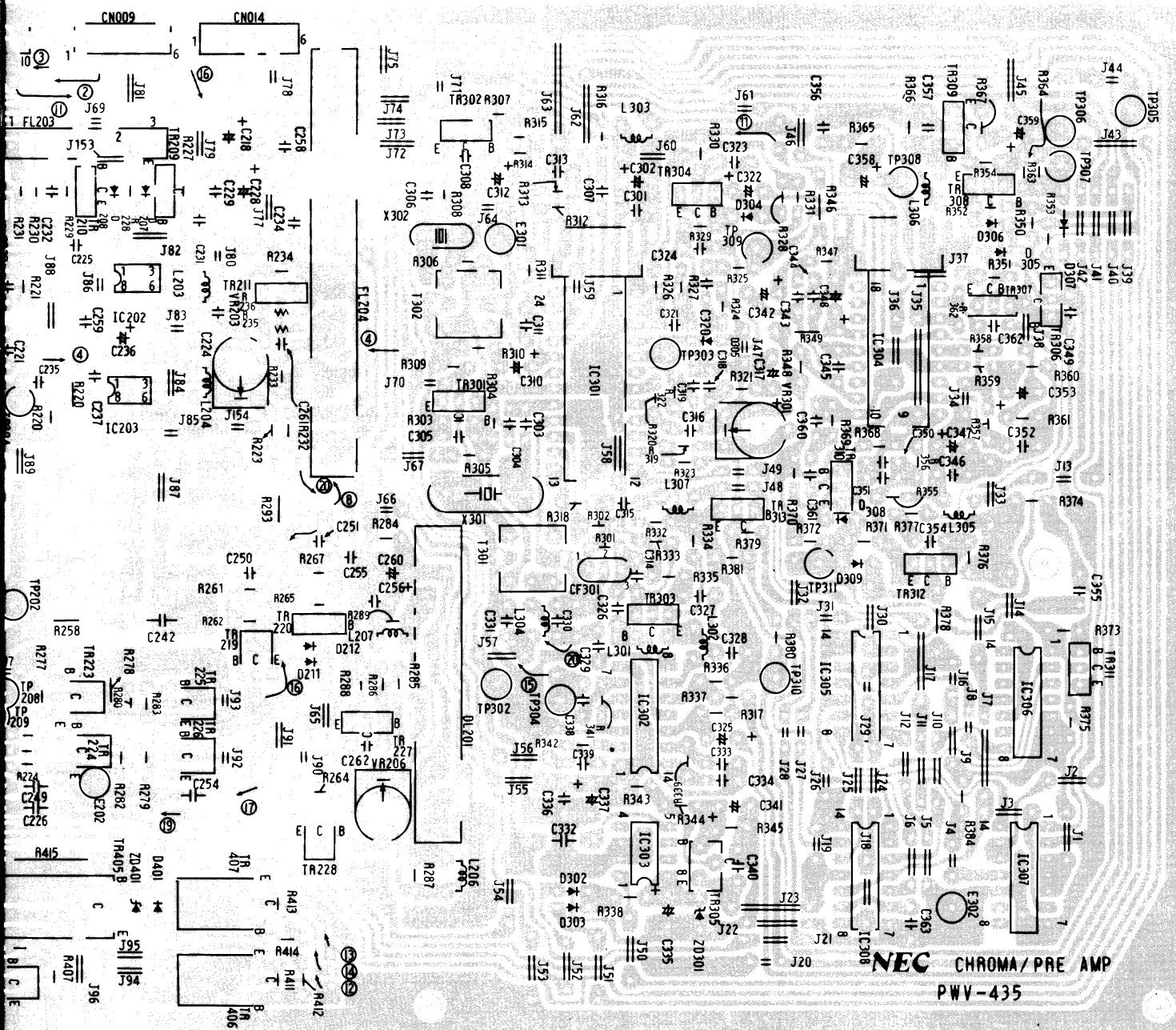
Note
— : REC
- - : PLAY BACK

CHROMA PREAMP PWB ASS'Y



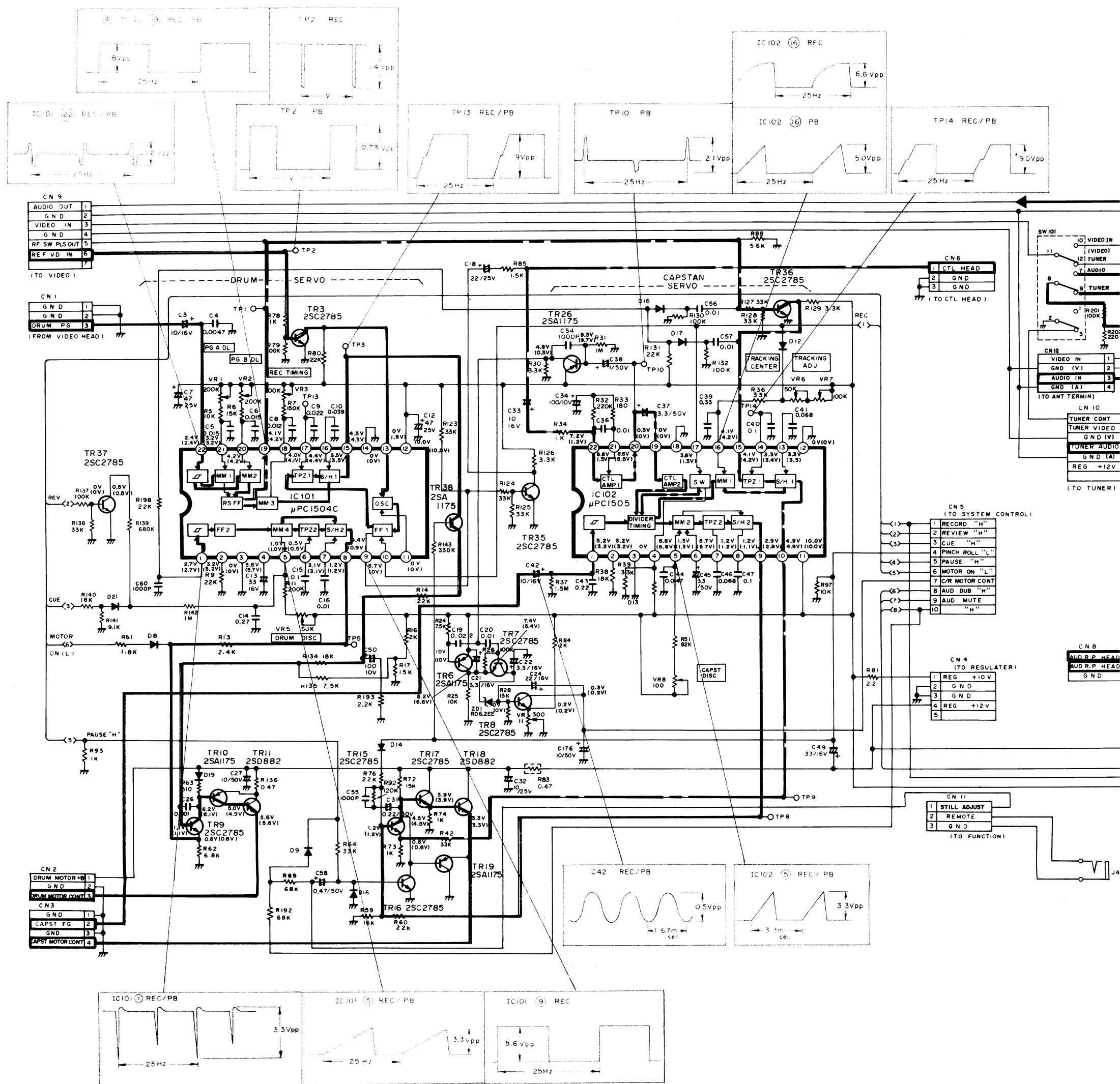
Y. PROCESS





MC-Service

SERVO/AUDIO (PWV-541) CIRCUITS



MC-Service

DRUM SERVO COMPARISON SIGNAL

SPEED SERVO

	REFERENCE SIGNAL	COMPARISON SIGNAL
REC	PG	PG
P. B.	PG	PG

PHASE SERVO

	REFERENCE SIGNAL	COMPARISON SIGNAL
REC	VD	PG
P. B.	X.TAL VD	PG

CAPSTAN SERVO COMPARISON SIGNAL

SPEED SERVO

	REFERENCE SIGNAL	COMPARISON SIGNAL
REC	FG	FG
P. B.	FG	FG

PHASE SERVO

	REFERENCE SIGNAL	COMPARISON SIGNAL
REC	RF SW PULSE	FG
P. B.	RF SW PULSE	CTL

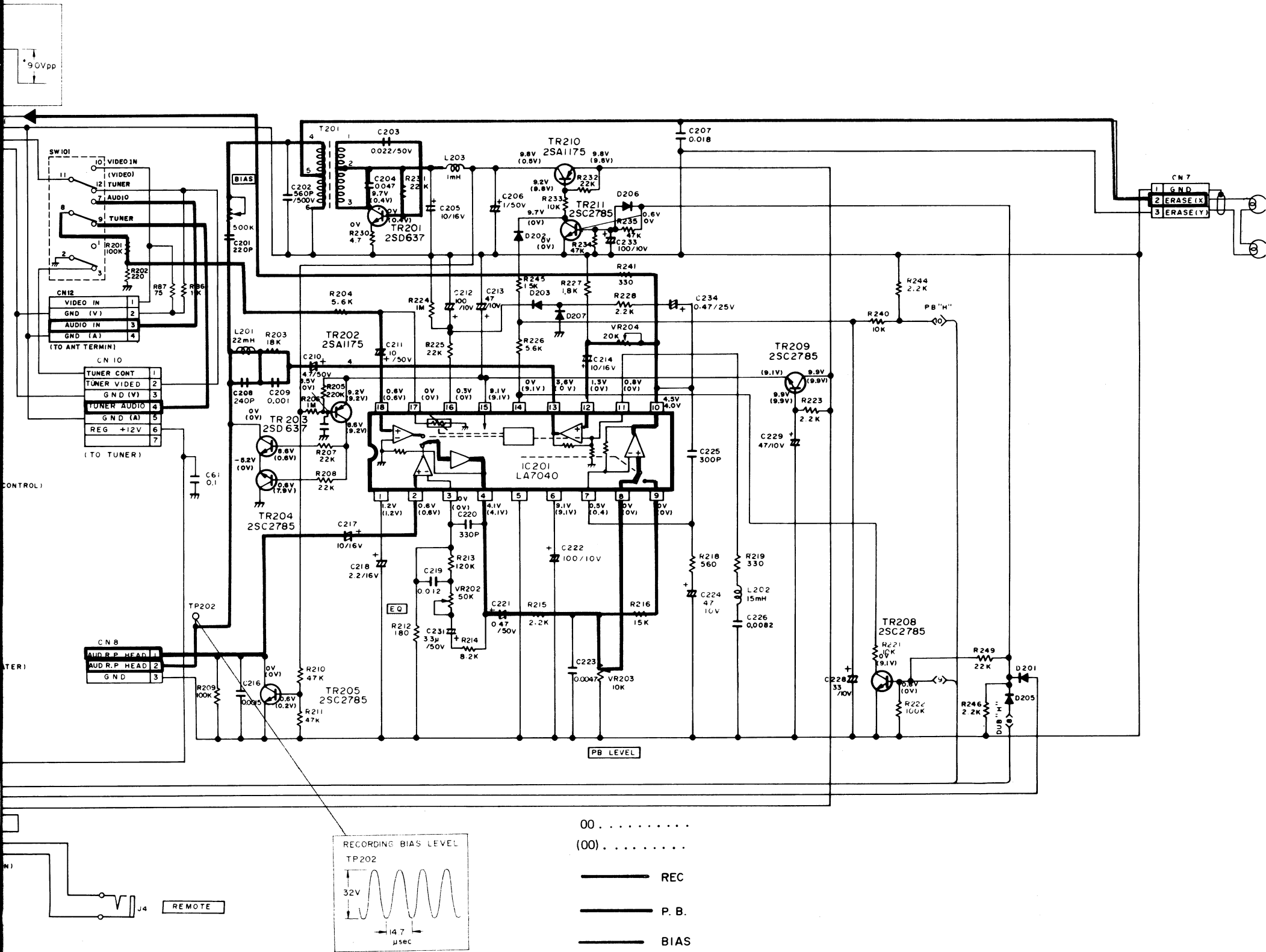
— SPEED SYSTEM (PG)

— PHASE SYSTEM (VD, X.TAL VD)

— SPEED SYSTEM (FG)

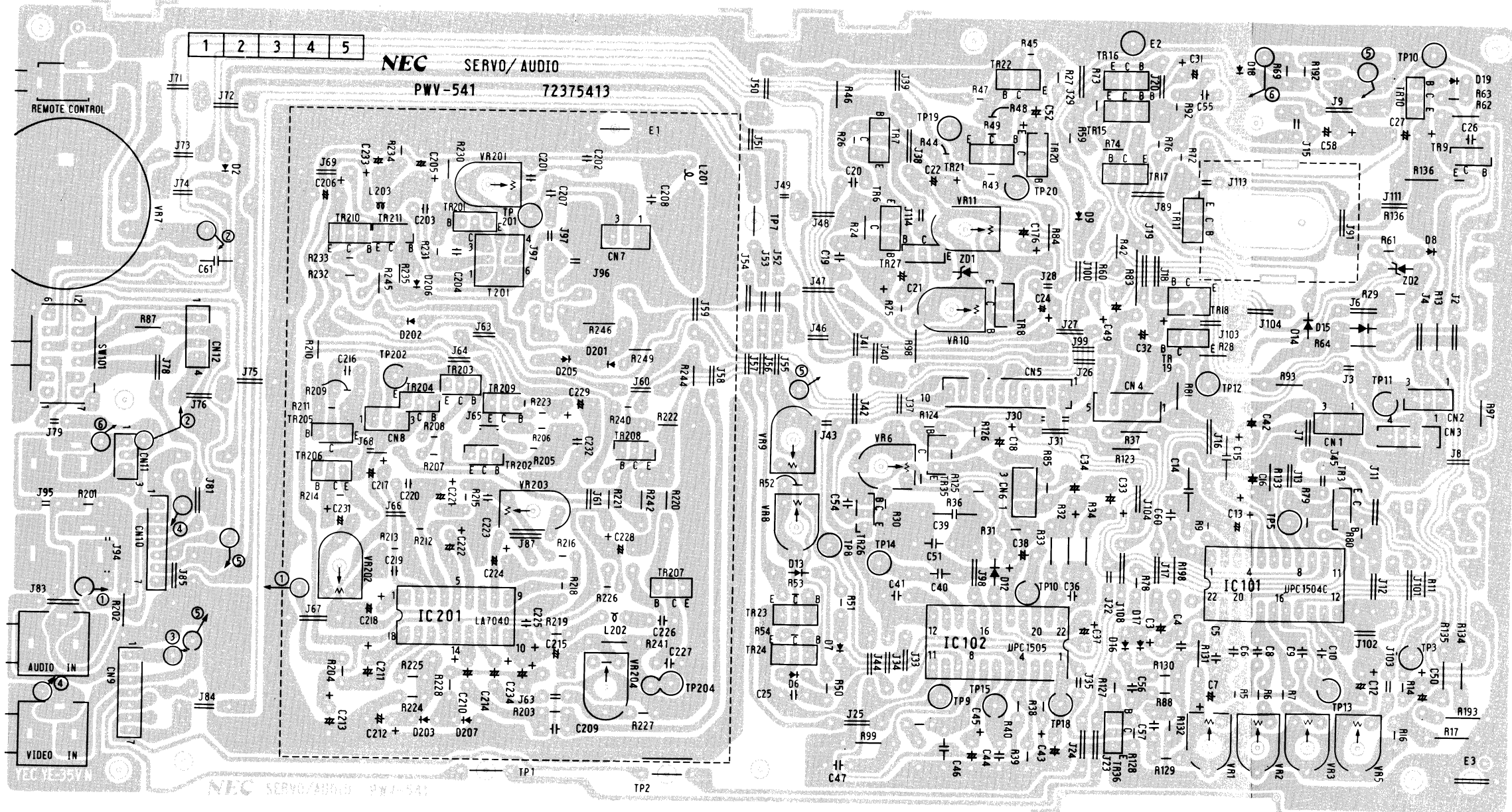
— PHASE SYSTEM (RF SW PULSE)

— PHASE SYSTEM (CTL)



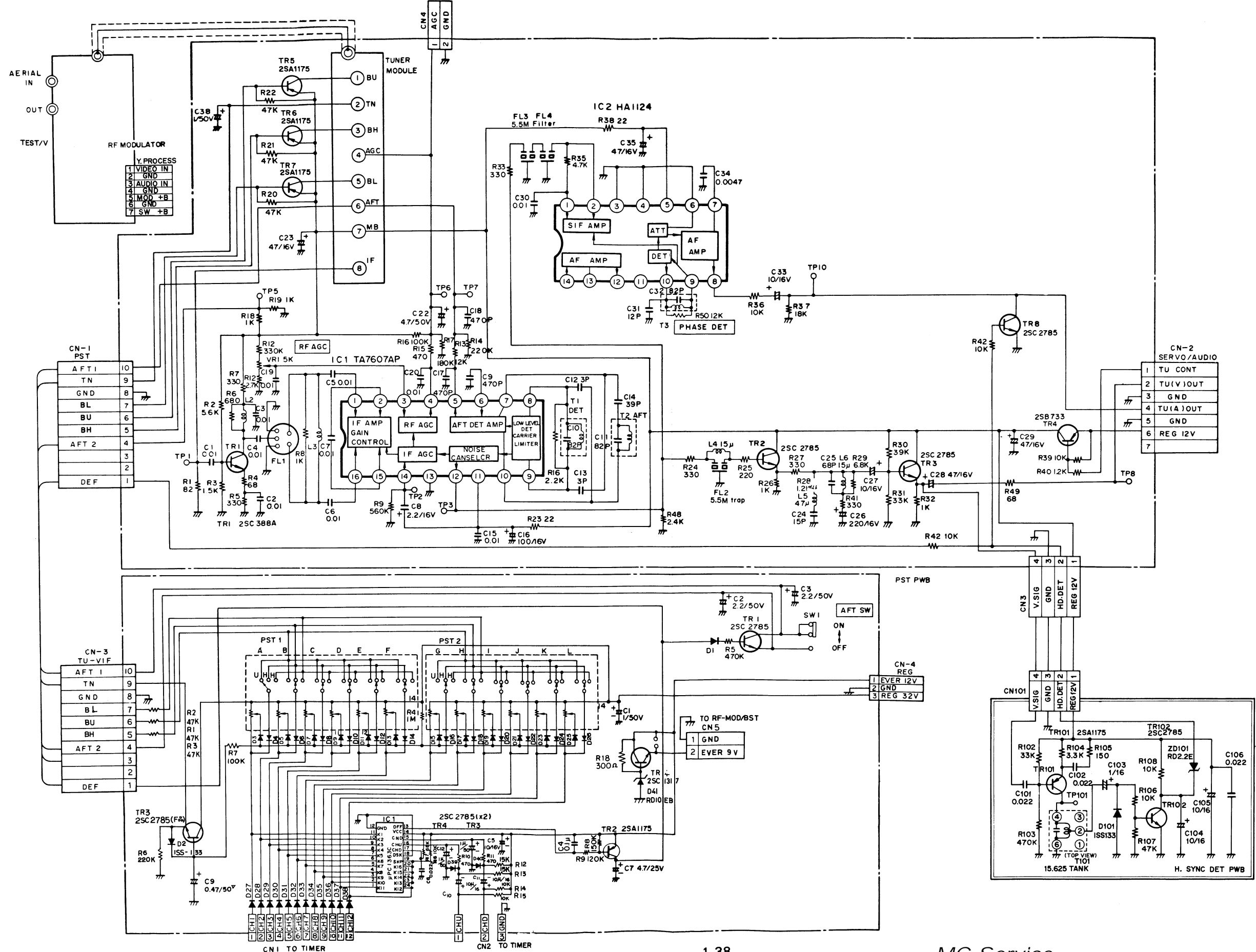
MC-Service

SERVO/AUDIO PWB ASS'Y

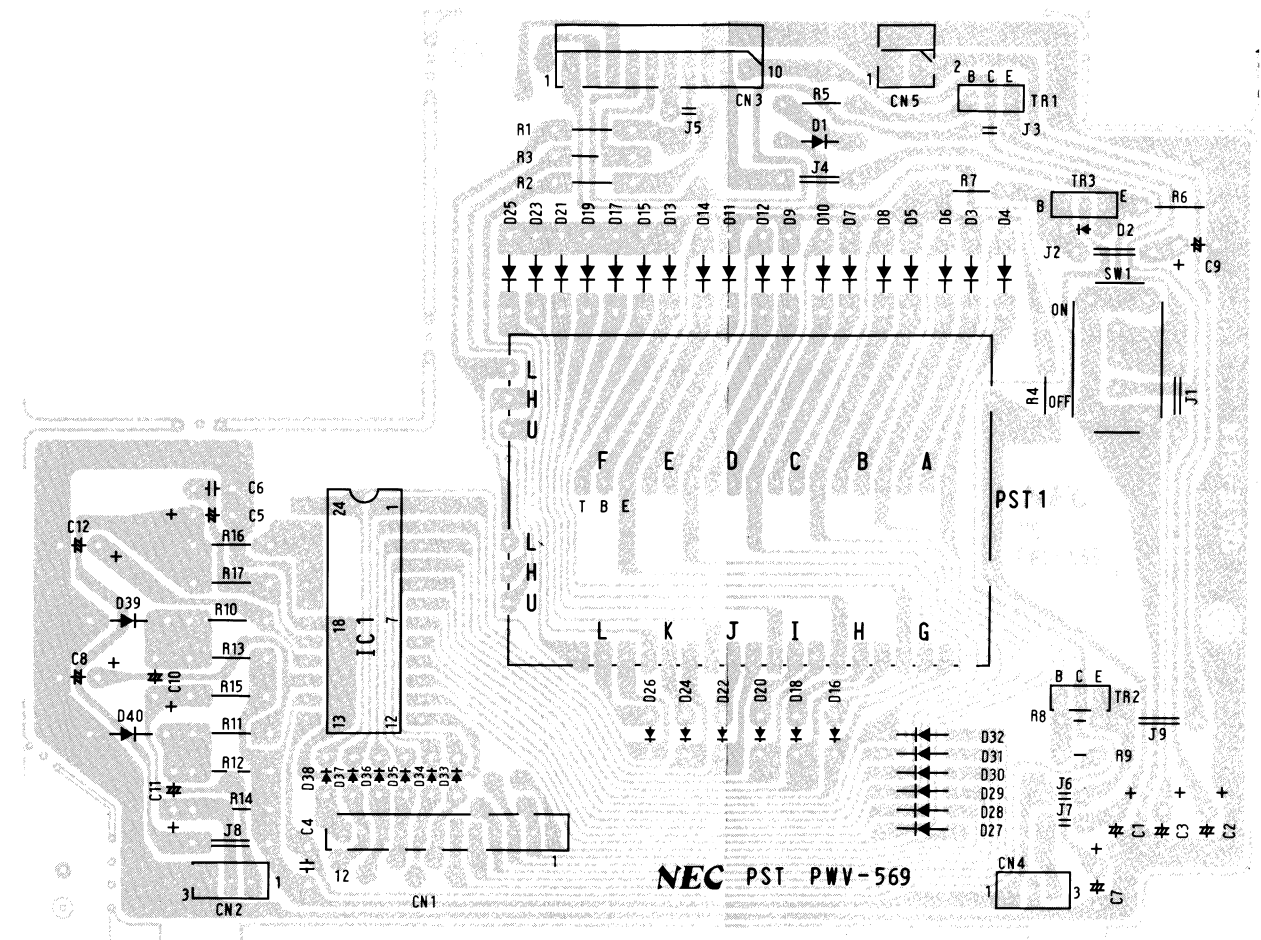
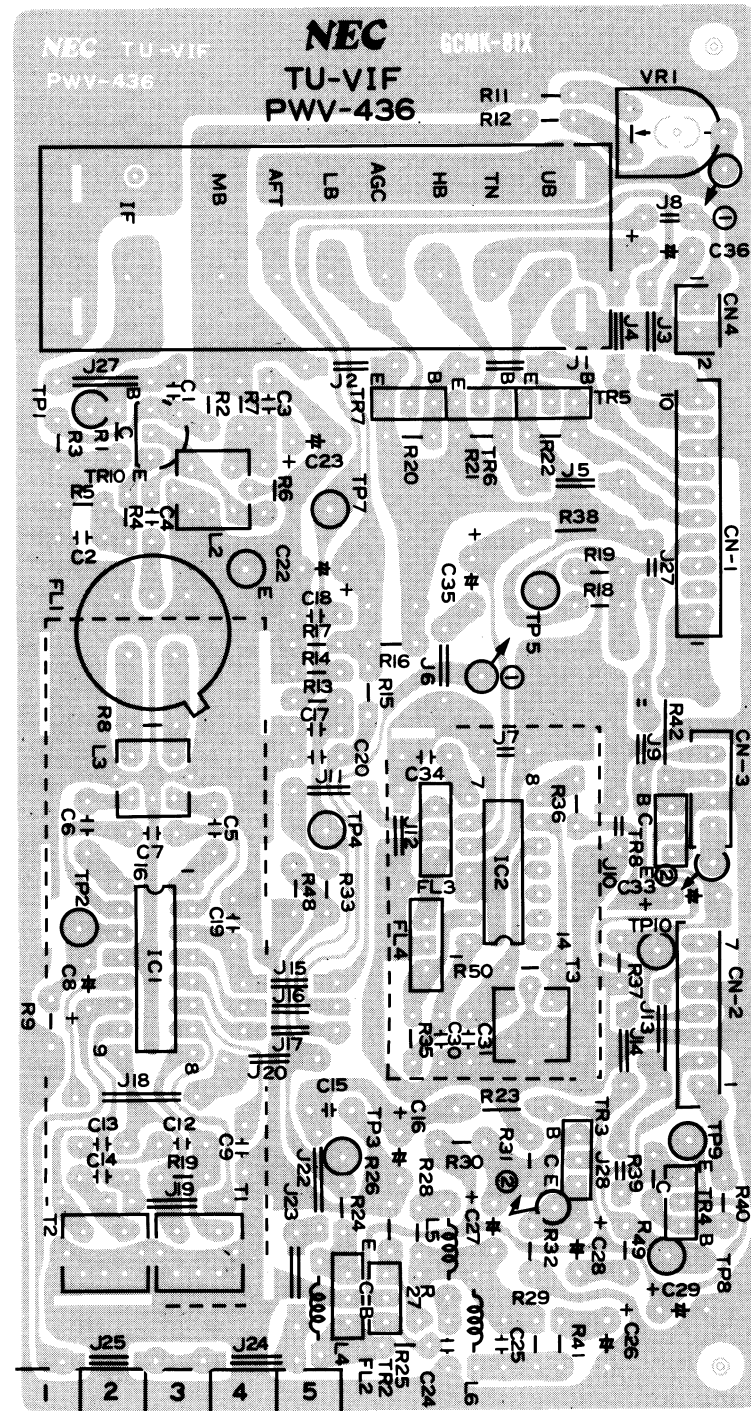


MC-Service

TU-VIF (PWV-436)/PST (PWV-569) CIRCUITS

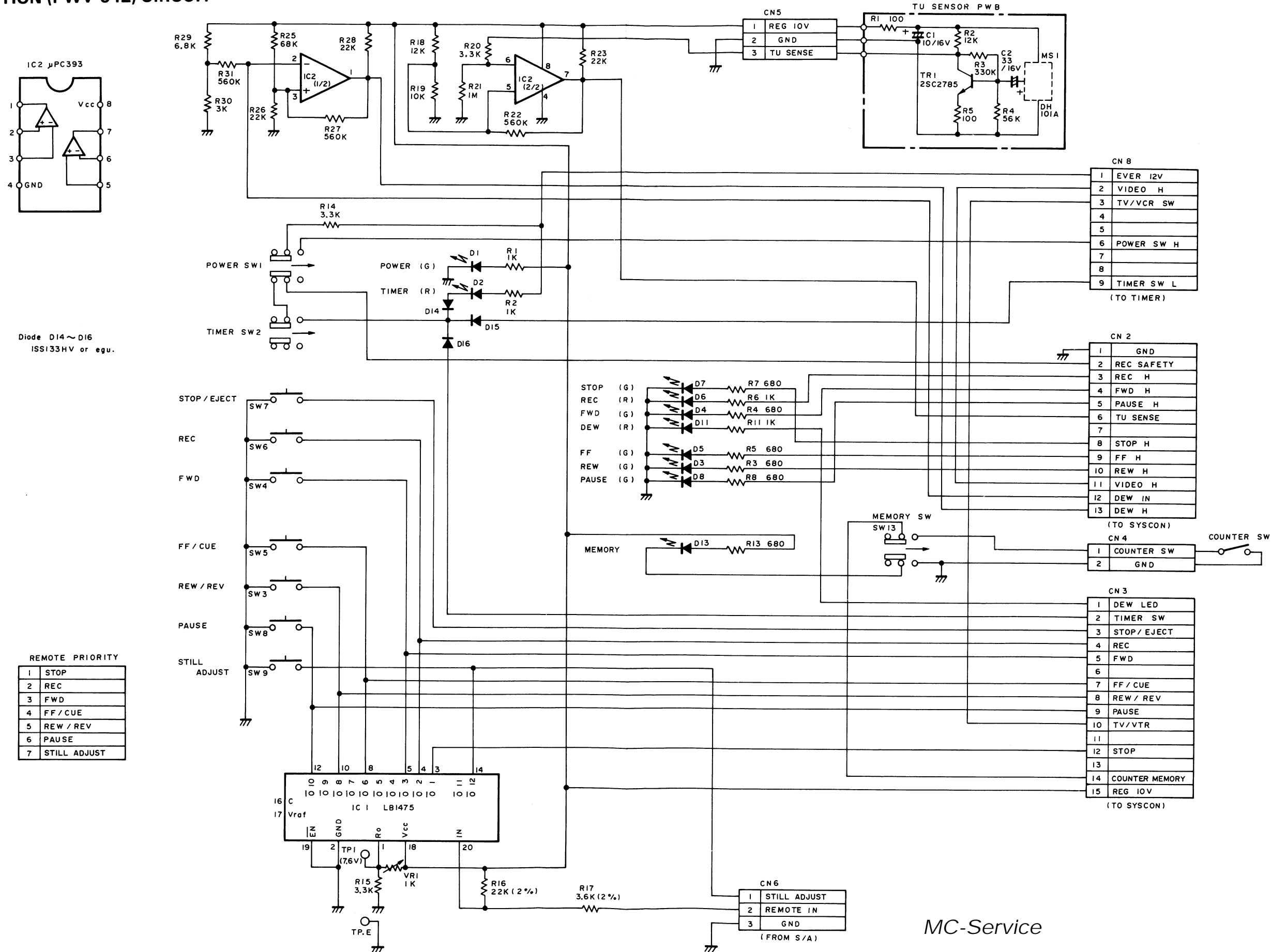


TU-VIF (PWV-436)/PST (PWV-569) PWB ASS'Y



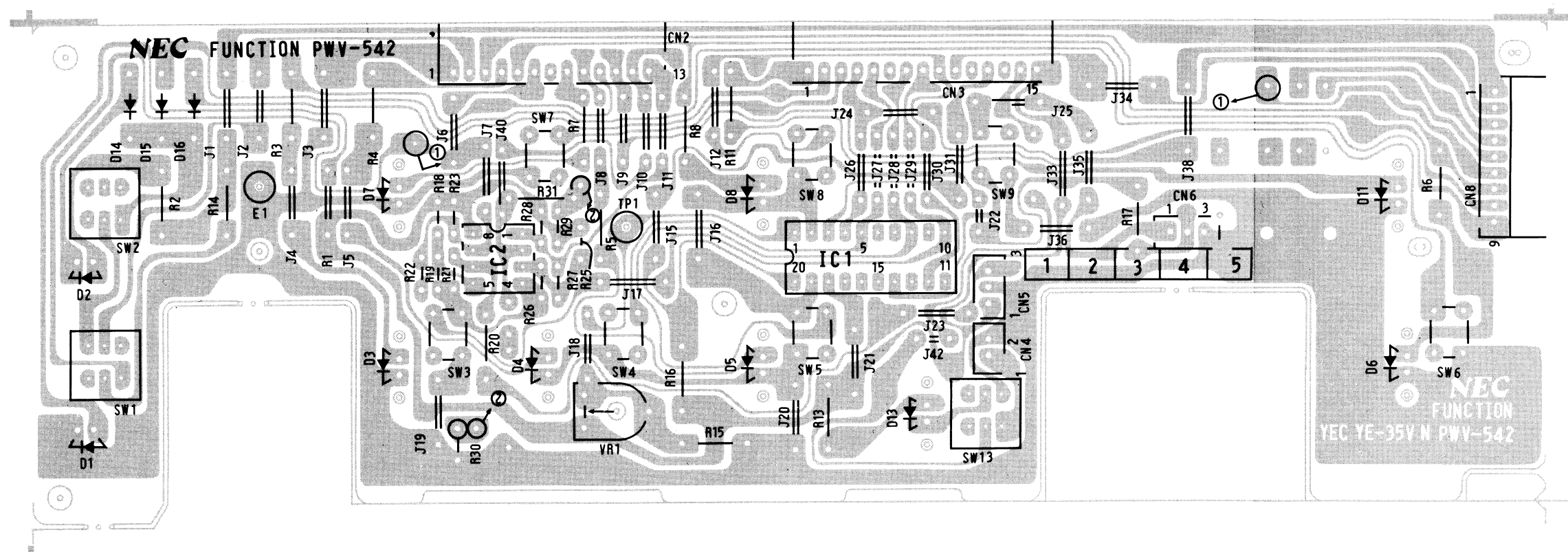
MC-Service

FUNCTION (PWV-542) CIRCUIT



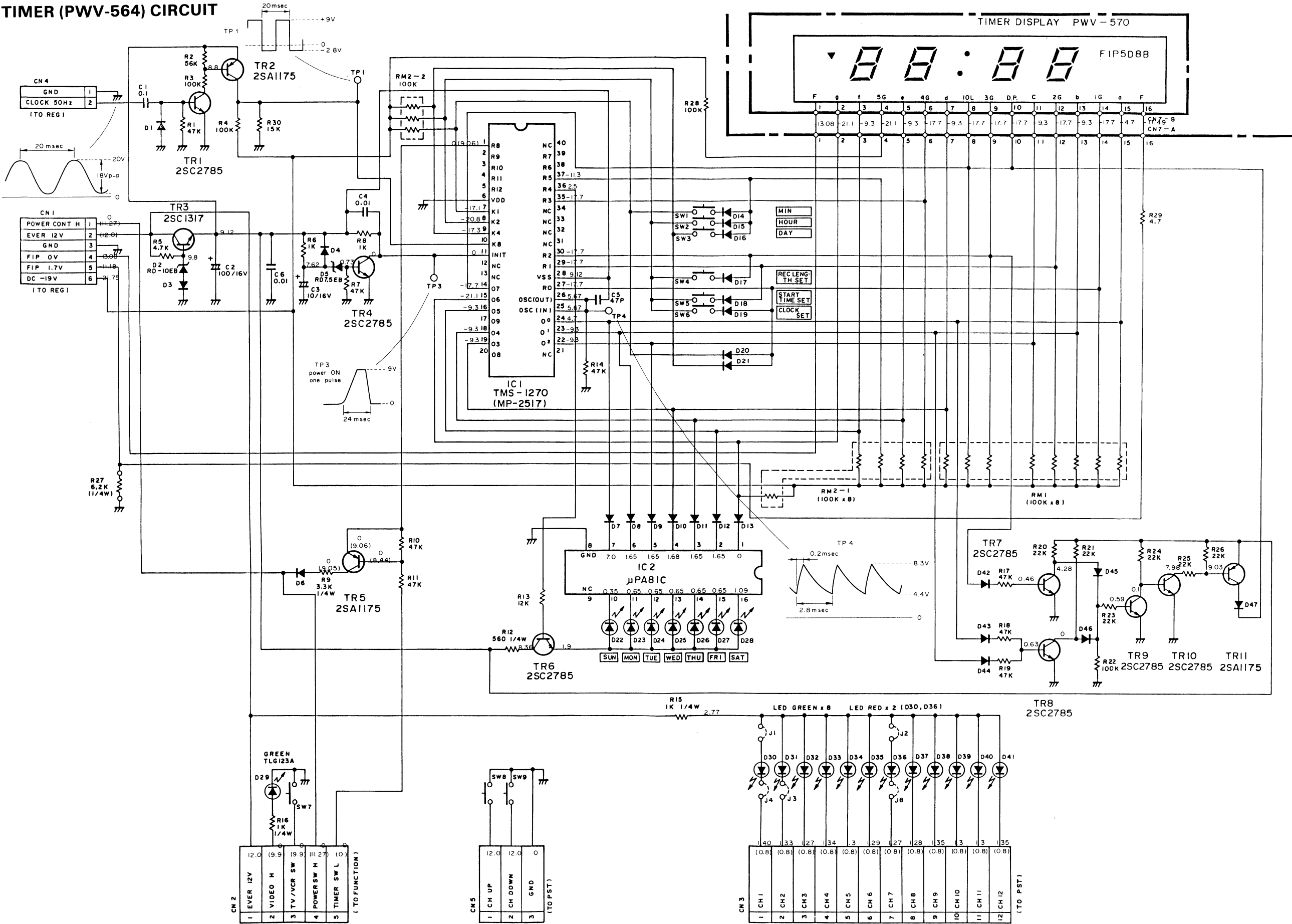
MC-Service

FUNCTION (PWV-542) PWB ASS'Y

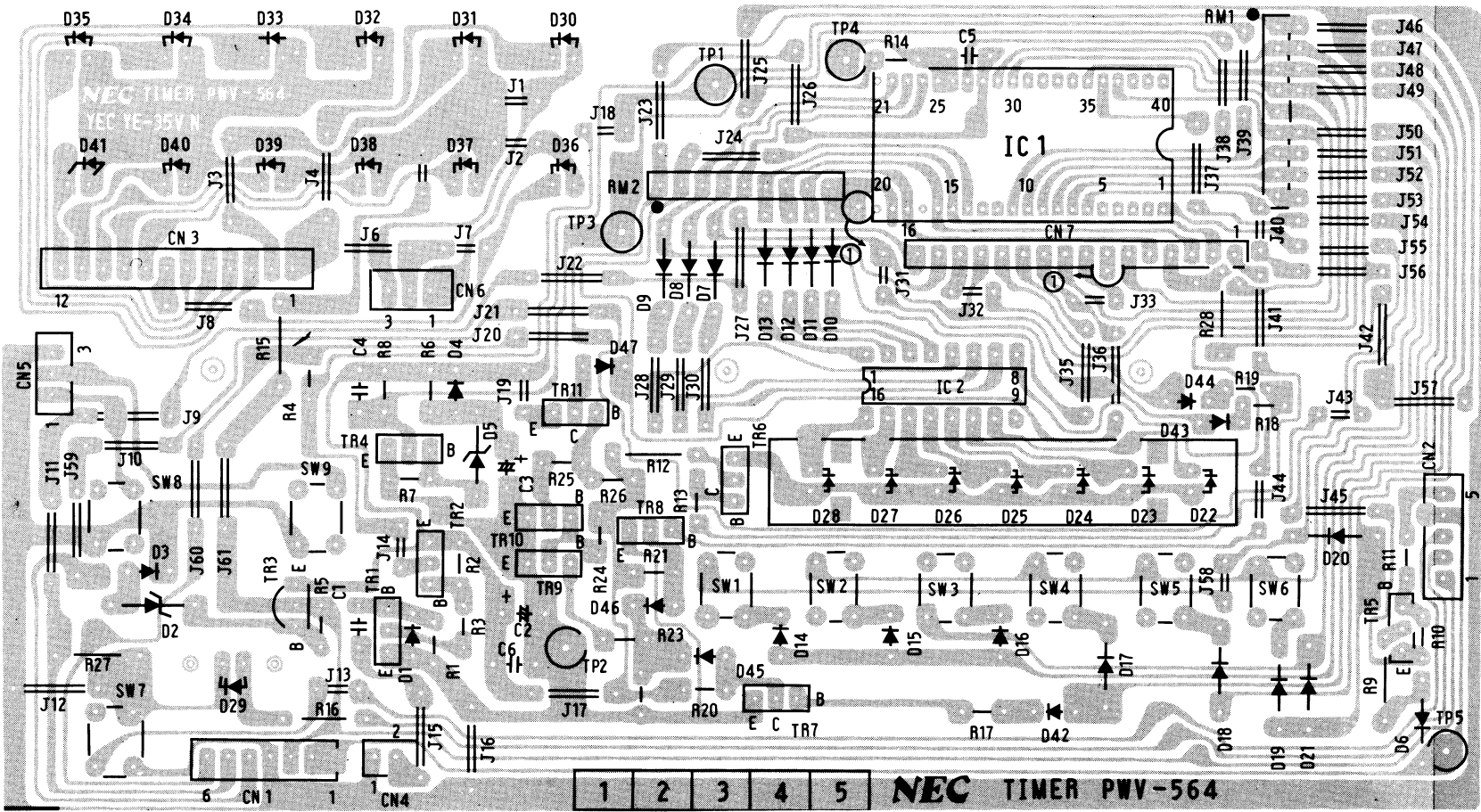


MC-Service

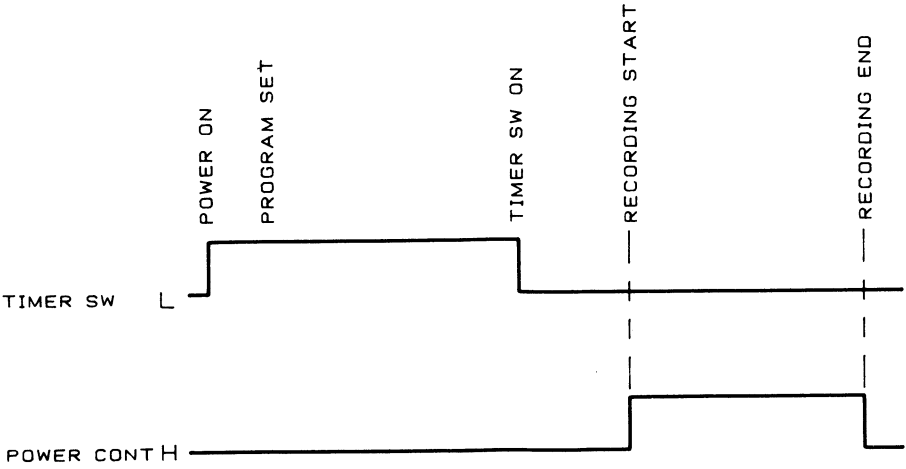
TIMER (PWV-564) CIRCUIT



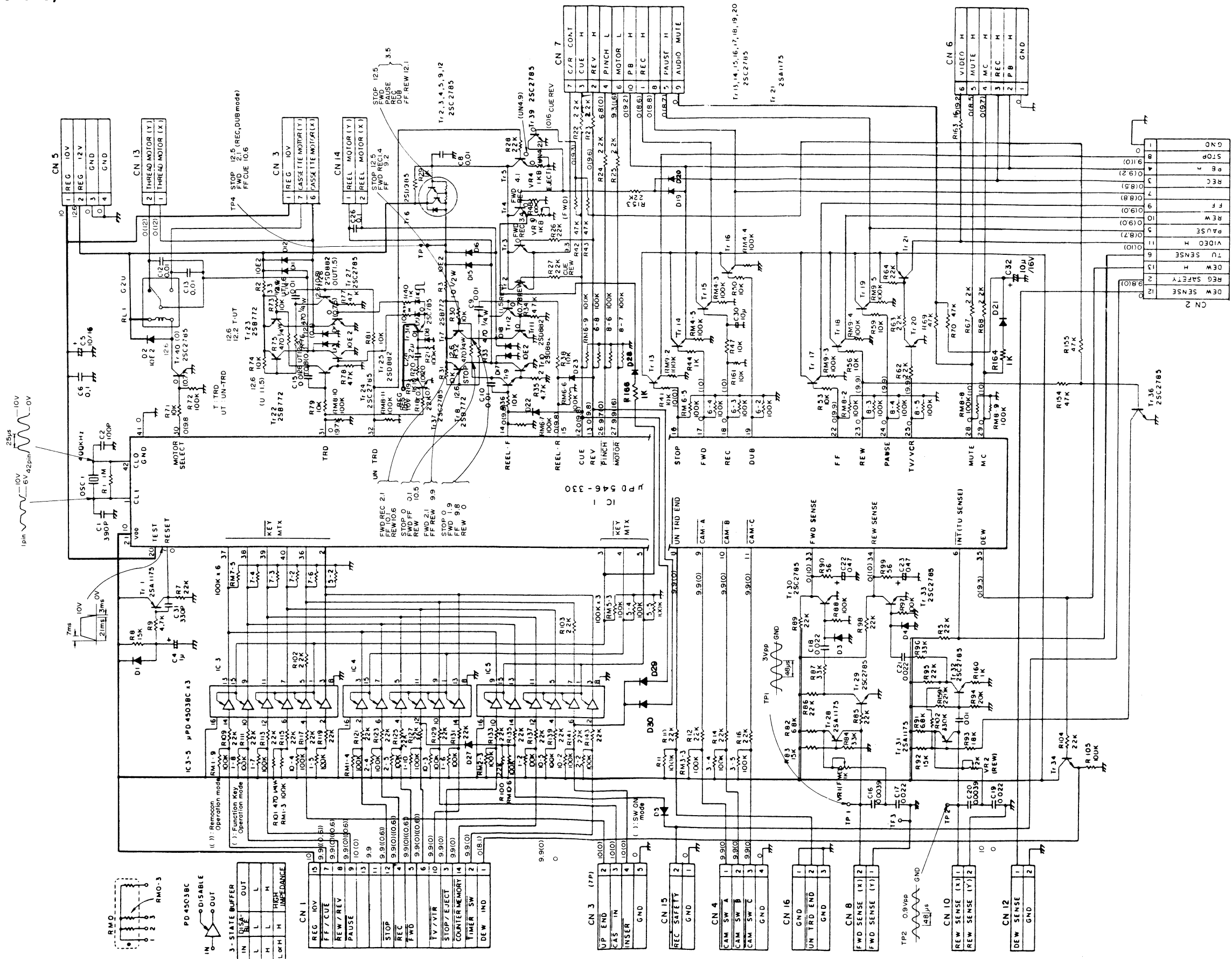
TIMER PWB ASS'Y



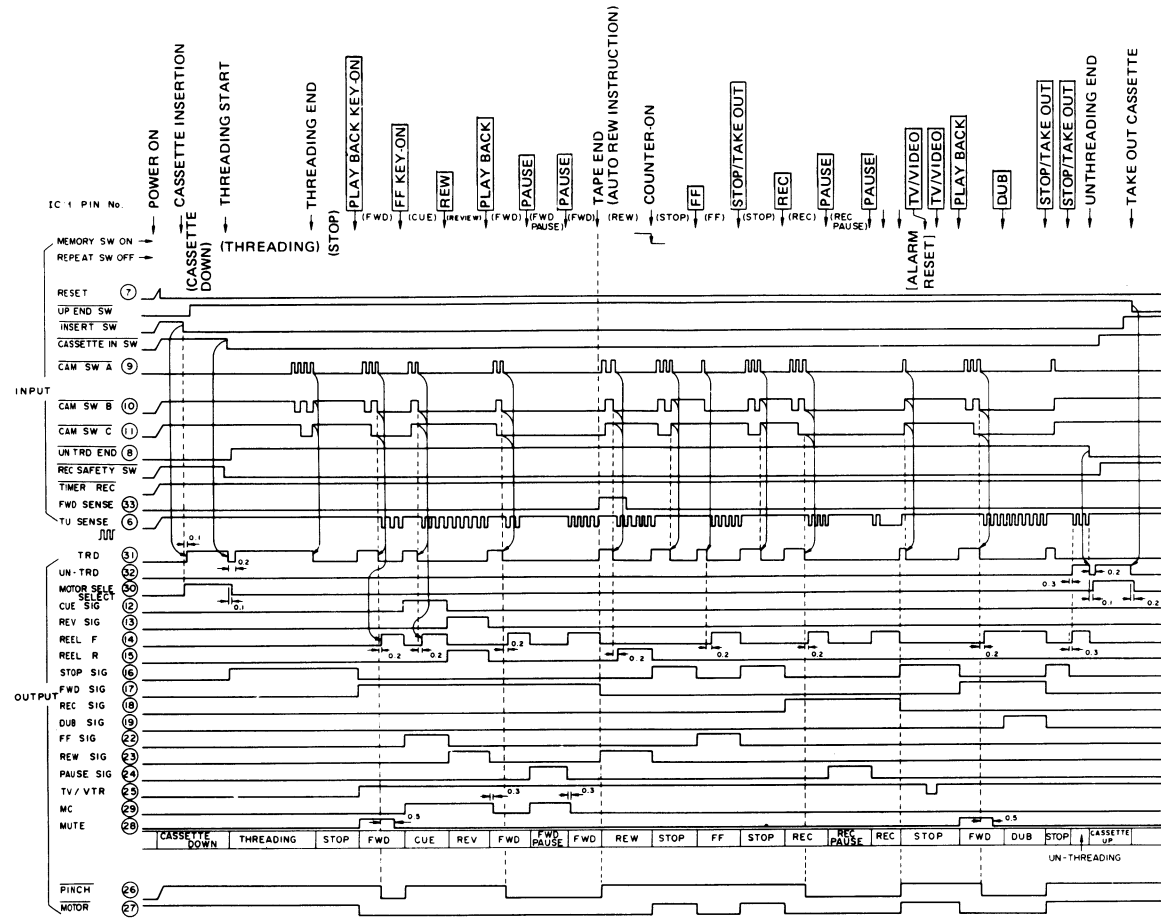
Timer recording timing chart



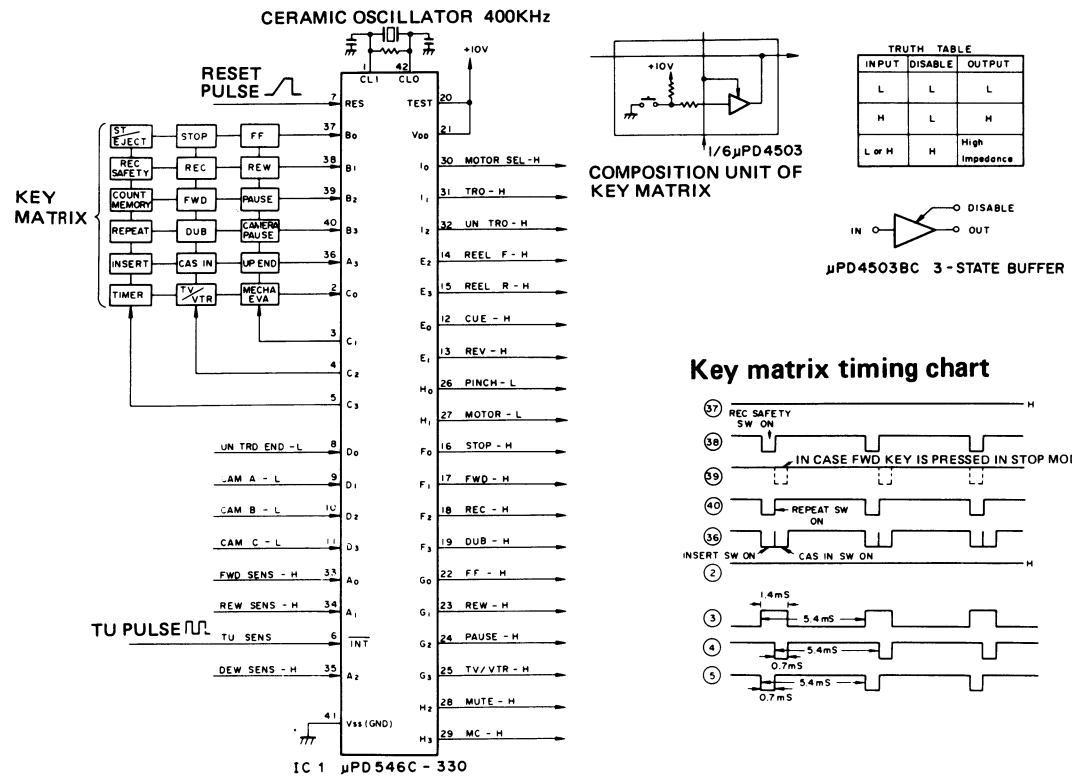
SYSCON (PWV-423) CIRCUIT



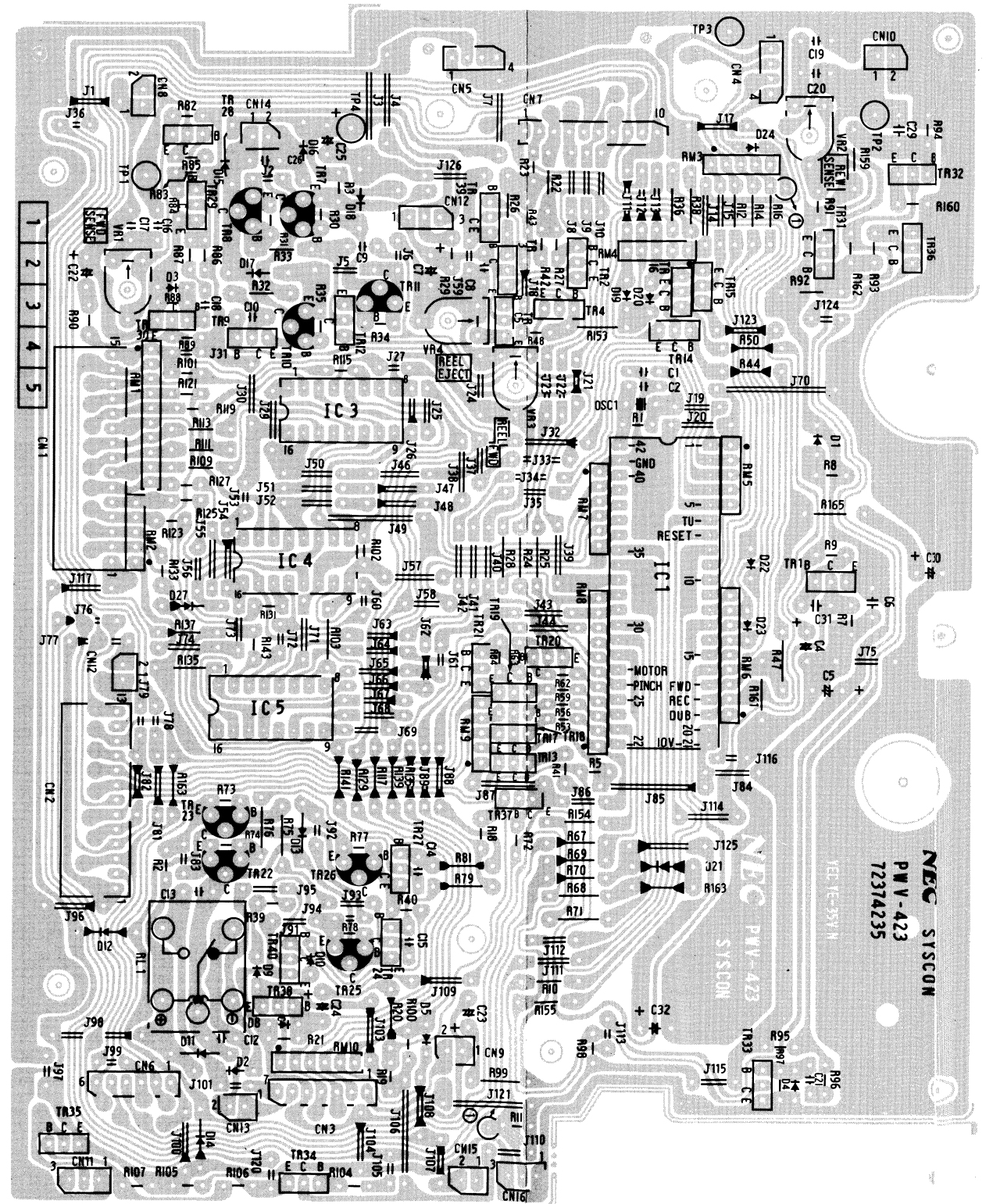
System control timing chart



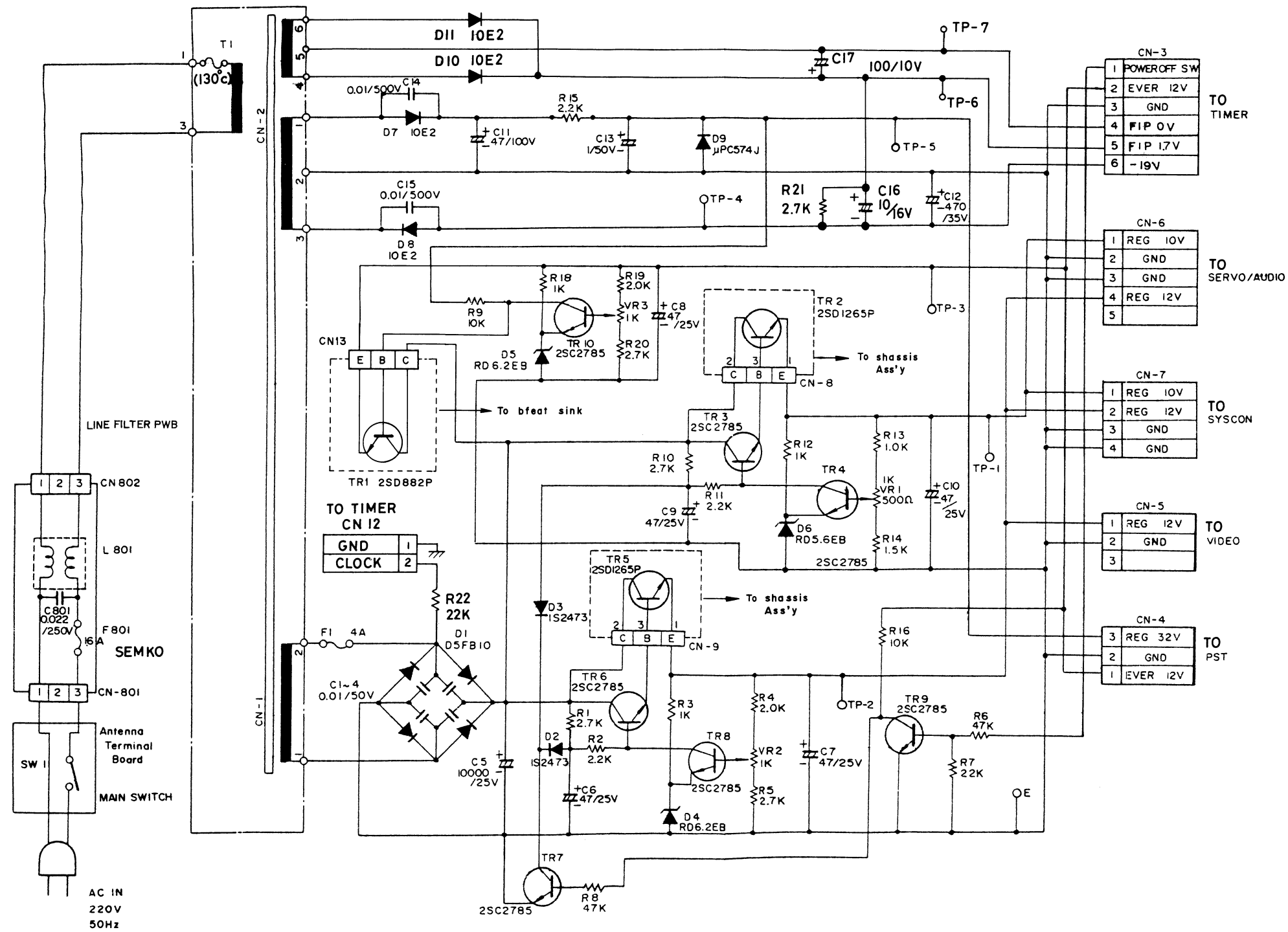
System control microcomputer input/output diagram



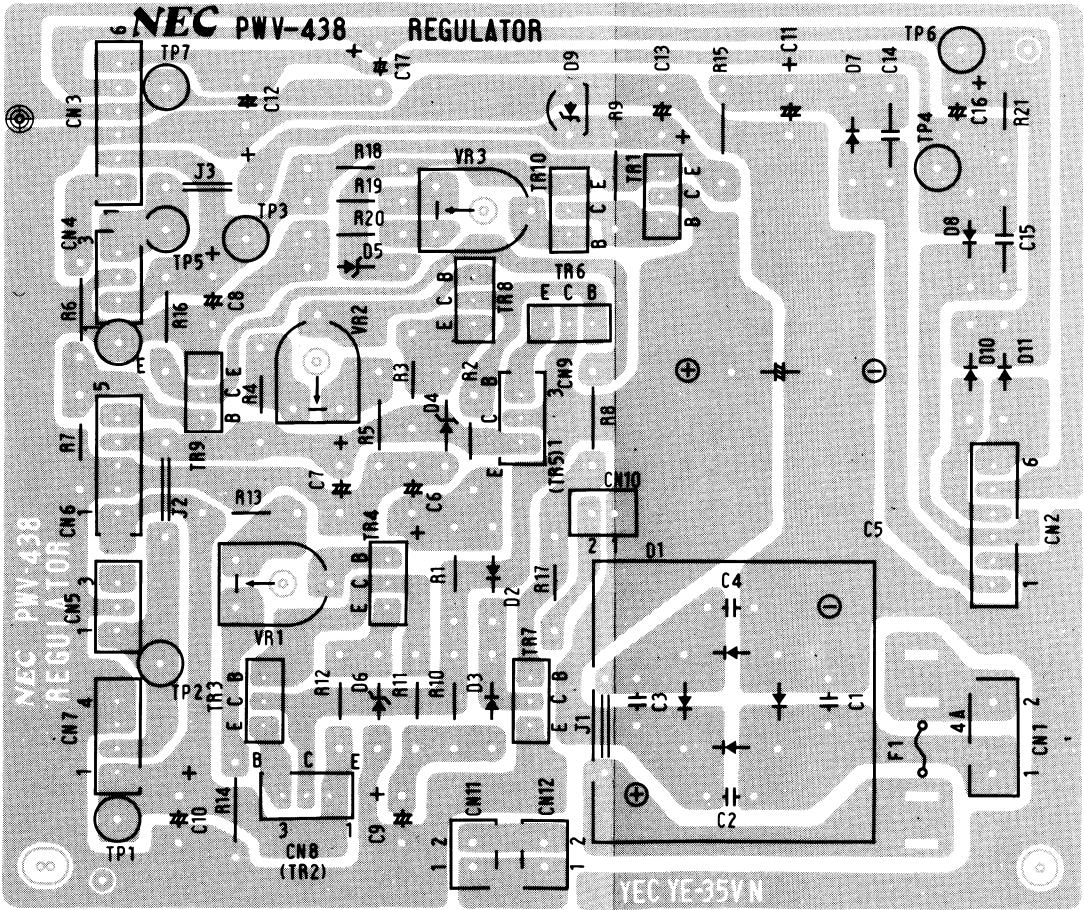
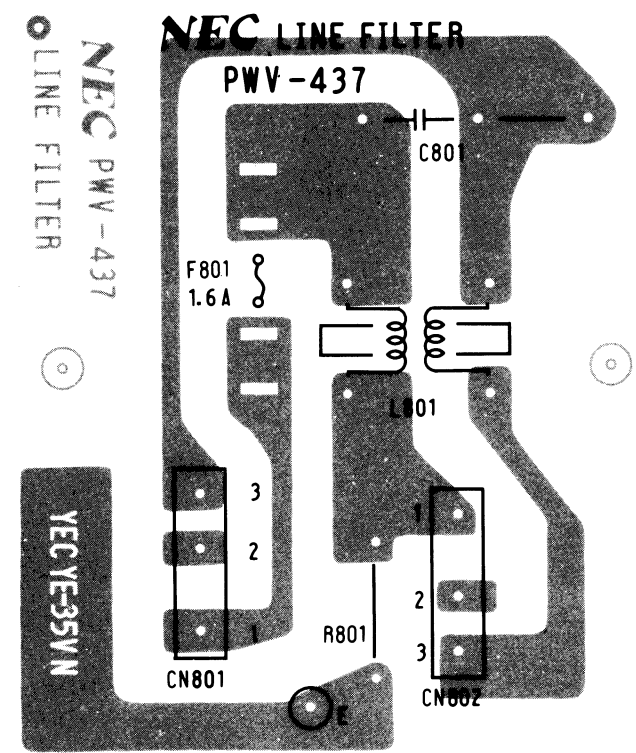
SYSCON (PWV-423) PWB ASS'Y



REGULATOR (PWV-438)/LINE FILTER (PWV-437) CIRCUITS

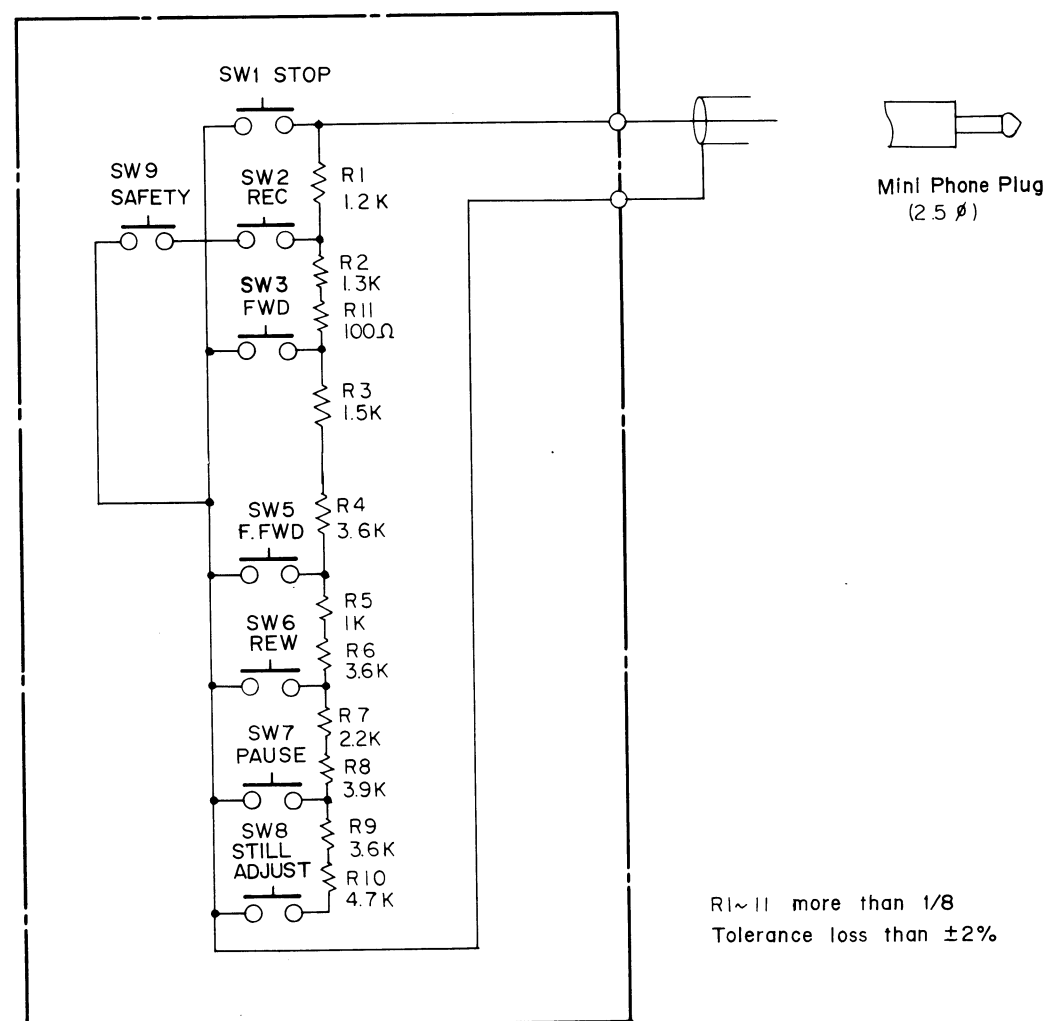
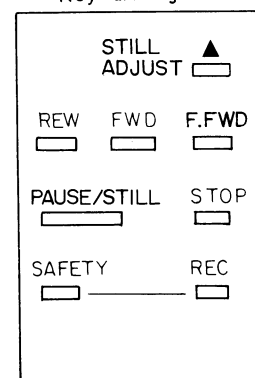


REGULATOR (PWV-438)/LINE FILTER (PWV-437) PWB ASS'Y



MC-Service

Key arrangement



MC-Service

SECTION 2

MECHANICAL MAINTENANCE

2-1. DISASSEMBLY

2-1-1. Removal and Reassembly of Cabinet

1. How to Remove Cabinet

- (1) Remove four screws ① for top cover assembly and disassemble the top cover assembly with it moved in the direction of an arrow.
Then put the set upright.
- (2) Remove five screws ② and remove the bottom plate.
Then put the set back in position.
- (3) Remove three screws ③ for front panel assembly.
Also remove one screw ④ for front panel assembly.

2. Note on Assembling and Disassembling

The front panel assembly and the bottom plate are secured together by means of screws ⑤.

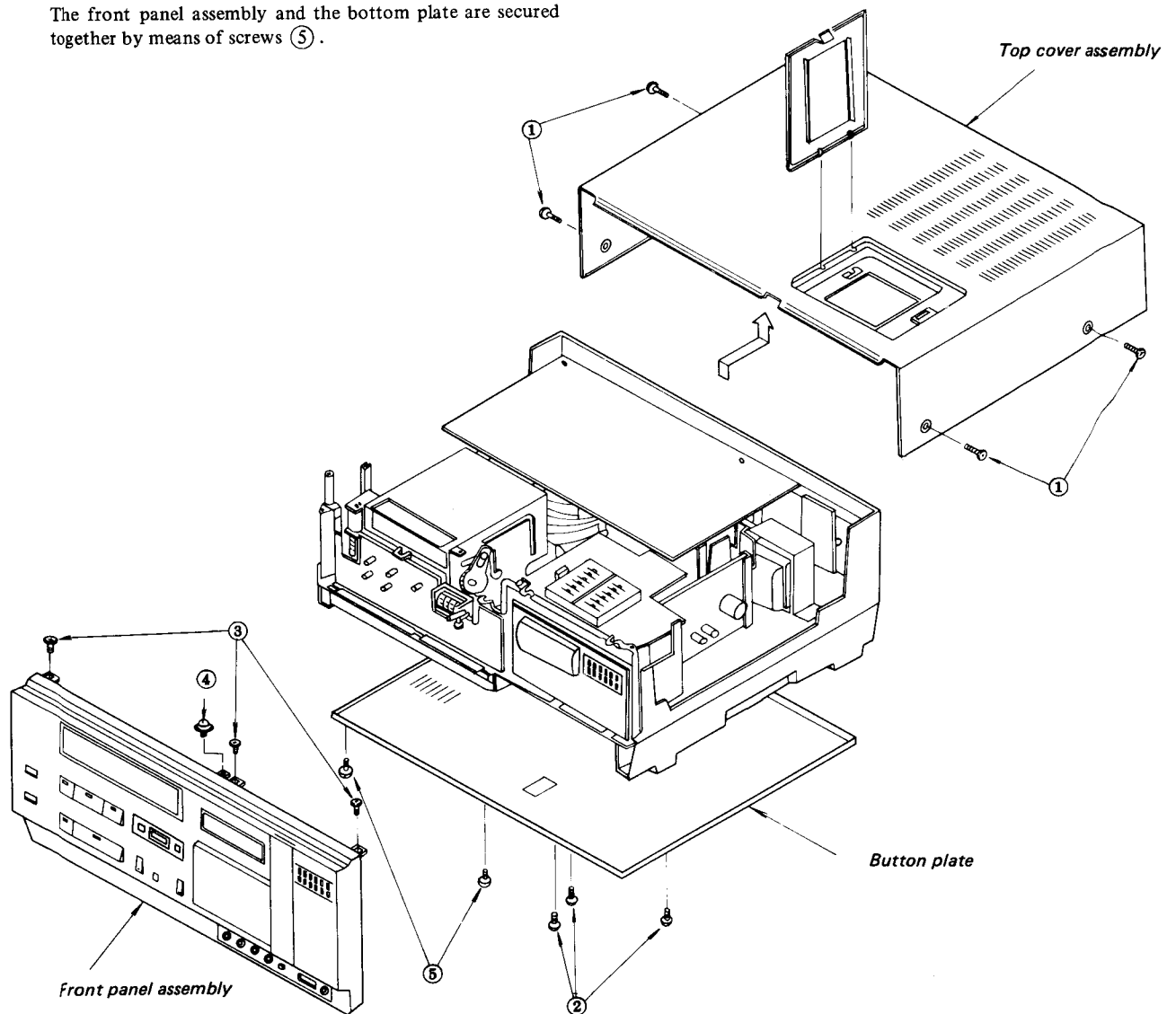


Fig. 2-1. Removal and Re-assembly of Cabinet

2-1-2. How to Remove the Cassette Housing

Note:

1. Remove one connector.
2. Remove four screws.

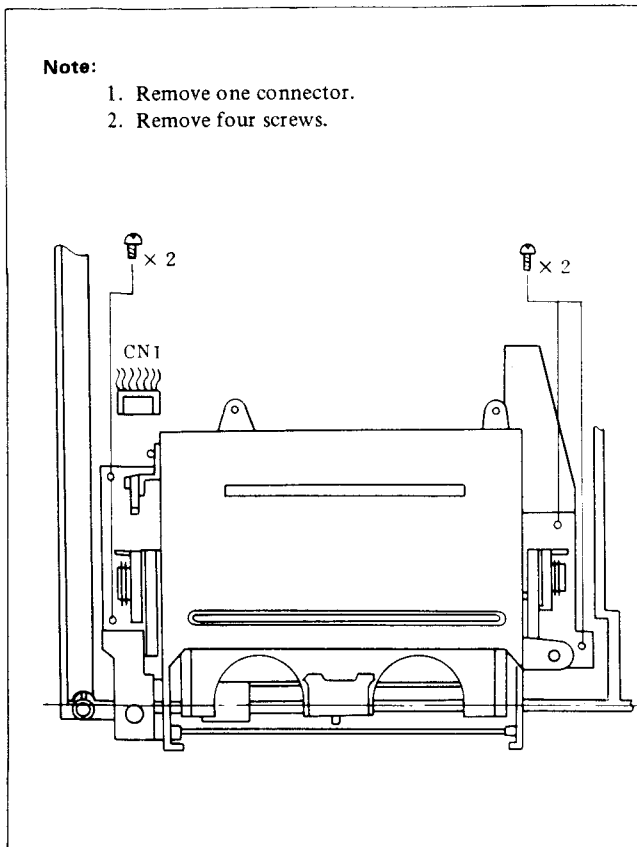


Fig. 2-2.

2-1-3. How to Remove Syscon, S/A Board

Note: Do not open more than 90°

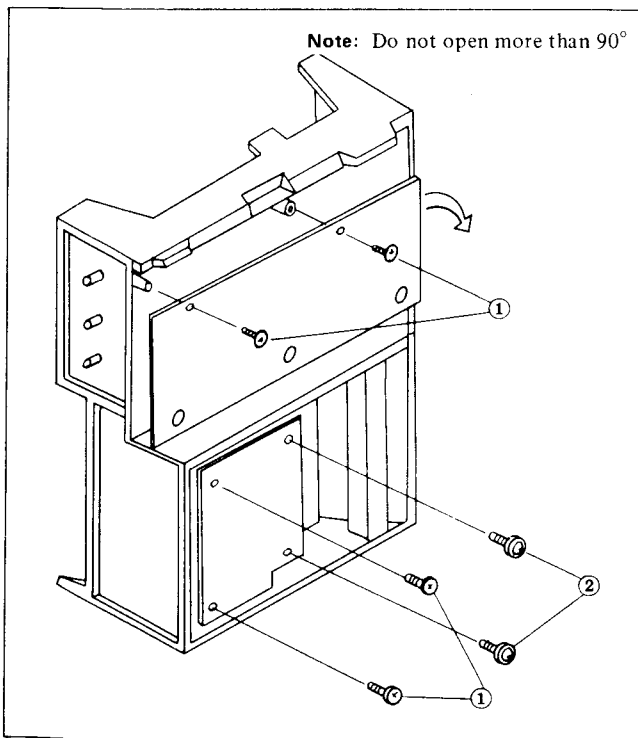


Fig. 2-3.

2-2. OPERATING THE RECORDER WITHOUT CASSETTE INSTALLED

2-2-1. How to do Threading

- (a) Make front threading.

Left side of cassette house

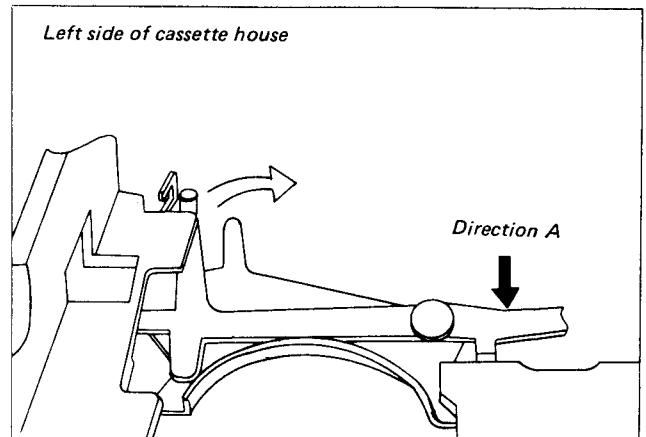


Fig. 2-4.

- (b) Press the Threading ON switch

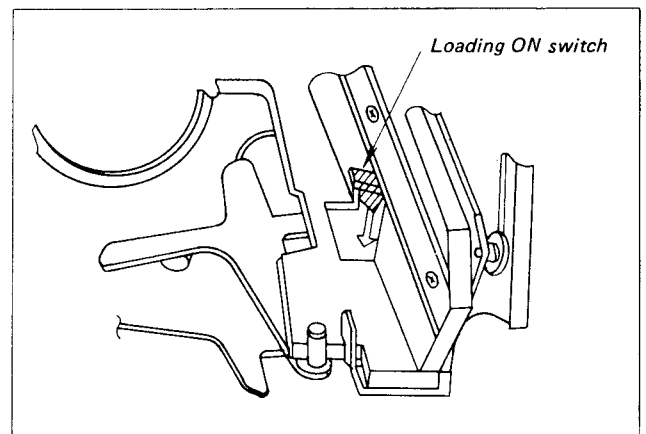


Fig. 2-5.

2-2-2. How to Establish/Playback, Fast Forward, and Rewind States Without Cassette

- Press the Threading ON SW shown in Fig. 2-5 above (this switch needs not be held). Then press desired function button to select each state desired.

2-2-3. How to Establish Recording State without Cassette

Press the REC button while keeping the erratic erasure prevention switch pressed.

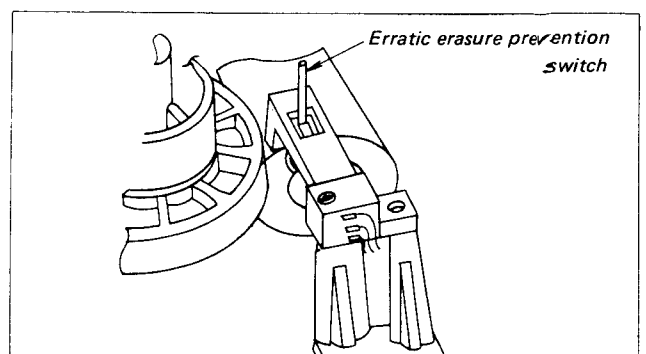


Fig. 2-6.

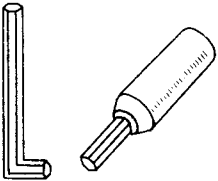
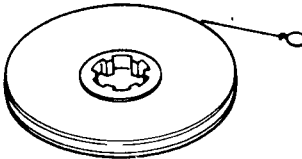
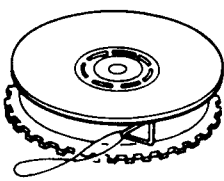
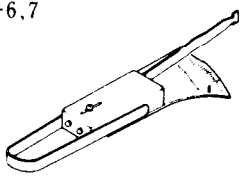
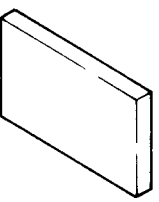
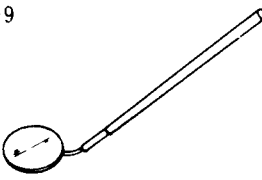

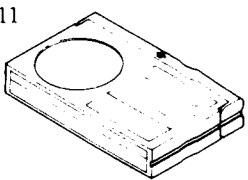

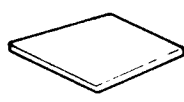
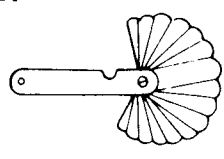
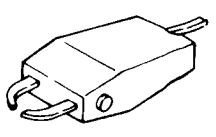
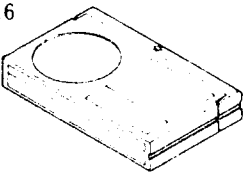
2-3. Jigs, Tools, and Fixtures

Ref. No.	Name	Applications and Others
J-2	Hexagon wrench and hexagon screwdriver.	For removing and mounting the rotary drum and drum assembly.
J-4	Reel tension gauge.	For measuring various torques.
J-5	FWD backtension measuring jig.	For measurement of FWD back tension.
J-6	Segment gauge (for 50 g)	For measurement of back tension and torque.
J-7	Segment gauge (for 100 g)	For measurement of back tension and torque.
J-8	Parallel plate	For adjustment of imperfect parallelism of audio/CTL heads.
J-9	Mirror for comb (handle) Mirror for comb (mirror)	For adjustment of tape path and checking the tape running adjustment.
J-10	Angle indexing rod	For adjusting the angle index of video head.
J-11	Alignment tape See below.	For adjustment of tracking and total adjustment of images.
J-12	Cleaning agent	For cleaning (isopropyl alcohol)
J-13	Cleaning cloth	For general cleaning.
J-14	Thickness gauge	For checking the clearance.
J-15	Head eraser	For demagnetizing the video and audio heads.
J-16	Cleaning cassette tape.	For cleaning the video head.

Alignment tape

Add the alignment tape to the jig kit.

Sketch No.	Description	Fixture No.	Code No.	Q'ty
11	Alignment tape KR5-2H PAL (and Q-version)		346-9019	1
11	Alignment tape KR5-1J SECAM		346-9018	1

J-2 	J-4 	J-5 	J-6,7 
J-8 	J-9 	J-10 	J-11 
J-12 	J-13 	J-14 	J-15 
J-16 			

2-4. PERIODIC CHECK AND MAINTENANCE

It is recommended that the following periodic check and maintenance be performed for obtaining the full function and performance of the machine and extending the lives of the machine and tape.

2-4-1. Maintenance After Repair

The following maintenance items must be performed after repair of the machine without regard to the operating hours of the machine.

- (1) Cleaning of the video head disk assembly
 - Press chamois saturated with isopropyl alcohol lightly on the video head disk assembly and turn the fan on the drum slowly by hand for cleaning. (Never try to clean the video head disk assembly with the motor running.)
 - Never move the chamois vertically against the head tips for cleaning, or the head tips will be damaged.

- (2) Cleaning of the tape movement system
Clean the surfaces which the tape contacts during its movement (the tape guides, drum assembly, capstan, and pinch roller) with chamois saturated with isopropyl alcohol.
- (3) Cleaning of the driving system
Clean the driving elements (such as belts, idlers, and reel table surfaces) with a piece of cloth saturated with isopropyl alcohol.

2-4-2. Periodic Check Items

Perform the maintenance and check listed on the table below, according to user's operating hours.

○ Cleaning ◎ Lubrication ★ Replacement ☆ Confirmation

		Operating Hour (H)	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Remarks
Maintenance & Check		Replacement Part No.											
Tape Movement System	Cleaning of tape movement system	—	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning & degaussing of ACE ass'y	—	○	○	○	○	○	○	○	○	○	○	
	Cleaning, degaussing & replacement of video head disk ass'y		○	★	○	★	○	★	○	★	○	★	The life of a head varies, depending on operational conditions and methods.
Driving System	Lubrication to thrust retainer	—	—	◎	—	◎	—	◎	—	◎	—	◎	Apply a drop of oil (such as sewing machine oil) on each of upper and lower bearings.
	Lubrication to thrust bearing (under reel table)	—	—	—	◎	—	—	◎	—	—	◎	—	Remove reel table and apply a drop of oil (such as sewing machine oil) on thrust bearing.
	Cleaning & replacement of capstan belt	16429592	○	○	★	○	○	★	○	○	★	○	<ul style="list-style-type: none"> • Cleaning must be done whenever repair is made. • Replacement must be done depending on operating hours on the table, or every two years.
	Cleaning & replacement of belts other than capstan belt	—	○	○	○	○	○	○	○	★	○	○	
Performance Confirmation	Abnormal sound	—	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which makes abnormal sound.
	Measurement of FWD back tension	—	—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to Section 3-15. Specified value: 40 to 50 g (when measured with jig tape)
	Confirmation of brake system	—	—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to Section 3-13.
	Confirmation of record & playback functions	—	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
FF/REW, idler cleaning and replacement		16172932	○	○	○	★	○	○	○	★	○	○	

- Belts other than capstan belt

Threading belt	:	16432191
Counter belt	:	16432421

(Note on Overhaul)

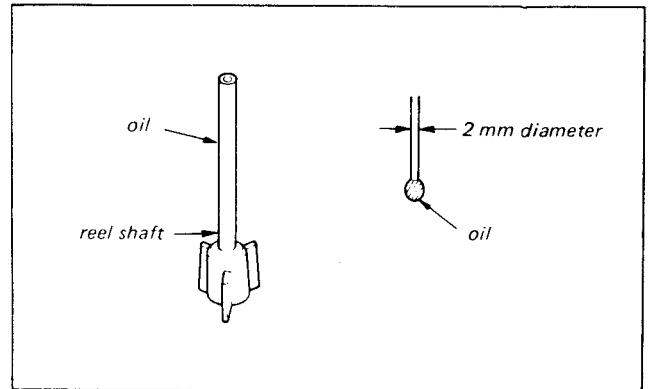
A part replacement must be done in the overhaul operation, referring to the listed items. The replacement periods of the motor and the head which are not included in the chart items are as follows.

Full erase head	about 4,000 operating hours
Capstan motor.	about 2,000 operating hours
Threading Motor	about 2,000 operating hours
Reel Motor.	about 2,000 operating hours
Cassette Motor	about 2,000 operating hours

2-5 OTHERS

2-5-1. Lubricating Oil

- Be sure to use DTE oil (or equivalent) for lubrication. (Various troubles will be caused, if a different viscosity oil is used.)
- Use the oil without dust or other foreign matter for the bearing lubrication. (If an oil containing dust and others is used, wear and burning of the bearing are apt to occur.)
- The quantity of "a drop of oil" is about the quantity that will stick to the tip of a 2 mm diameter stick, as shown in the figure below.



SECTION 3

CHECK, ADJUSTMENT AND REPLACEMENT PROCEDURES

3-1. REMOVAL OF ROTARY DRUM ASSEMBLY

1. How to Remove Rotary Assembly

- (1) Remove two setscrews ① of the disk plate and dismount the disk plate.
- (2) Remove a heater setscrew ② and dismount the ceramic heater.
- (3) Remove hexagonal holed screw ③ using a hexagon wrench.
- (4) Remove two screws ④ and dismount the upper drum.
- (5) Remove the solder from the flange printed wiring board (lead wires, red, white, yellow, and blue, at 8 points).
- (6) Remove four screws ⑤ and dismount the rotary drum assembly. (Some drum has to be secured by using two screws ⑤.)

Note: Care should be taken to avoid touching the head chip by hand or damaging it by bruising at that time.

2. How to Mount Rotary Drum Assembly

- (1) Vertically fit the rotary drum assembly in until the white lead wire comes to mark A of the flange printed wiring board. If it is caught in the way, remove this and attempt to fit it in once again.
- (2) Tighten two screws ⑤ and solder the lead wire.

Note: 1. There are four points at which setscrews are used for tightening parts. secure two points marked (A) and (B) using setscrews.

2. Carefully and properly solder, making sure that there is no lead wire disconnection.

- (3) Lightly tighten setscrews ④ and, after tightening the hexagonal holded bolt ③, tighten screw ④.

Note: Care should be taken to avoid the upper drum coming into contact with it when mounting the upper drum in.

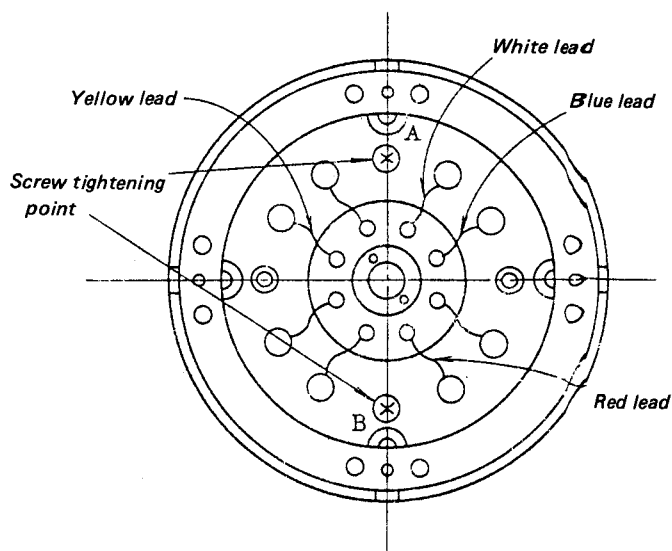
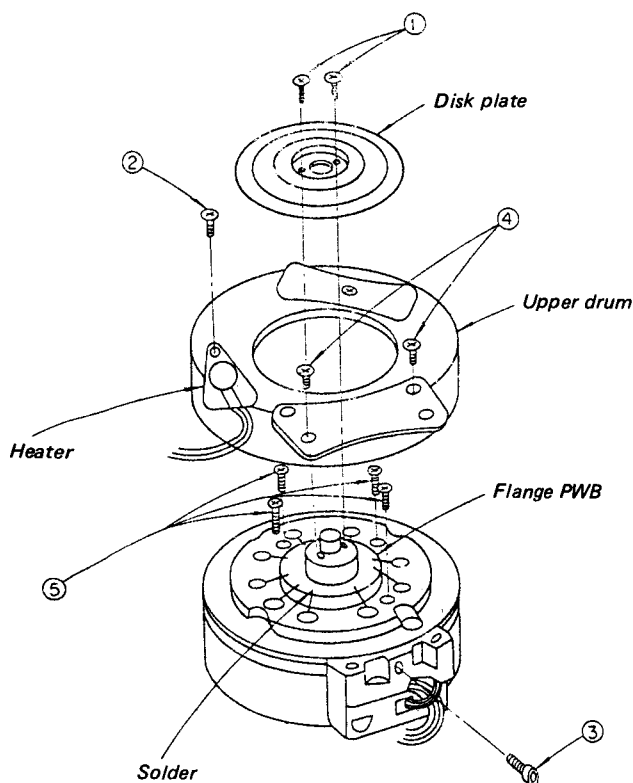
- (4) Dismount the heater with one screw ②.
- (5) Mount the disk plate using two screws.

3. Caution to be Taken When Replacing Rotary Drum Assembly

- (1) Do not attempt undue mounting or dismounting, when replacing the rotary drum assembly.
- (2) Before replacement, clearly clean the drum flange surface and the mounting surface of the rotary drum.
- (3) Secure the rotary drum assembly using two setscrews at the points marked *. (If four screws are used before replacement, throw away two setscrews.)
- (4) When soldering the lead wire of the video head onto the flange printed wiring board, confirm that a white lead is soldered onto the location A and red lead wire at location B.

For tape path adjustment and ACE ass'y position adjustment, refer to item 6-16-1.

For adjustment of the drum servo and slow servo, refer to item 7-3 and 7-4.



4. Check and Adjustment of Angle Index of Video Head

This adjustment is generally not required, but it is necessary to make adjustment when replacing the rotary drum assembly. When determining the angle index of the video head, the alignment tape has to be placed back, but at that time, it is necessary to do so with the tracking control knob in center clock position. When a position other than the center clock (in the condition in which the tracking is shifted) is checked, the image is reproduced as if it were improper even though the angle index is proper. It is essential that ACE assembly position adjustment (refer to item of Tape Path Adjustment) has been completed by that time.

Check Method

Reproduce the β II monoscope signal section of the alignment tape (KR5-1S) to check if the longitudinal line of the monoscope is reproduced in two lines, though this is originally one line directly below the switching pulse. If the line is single, no adjustment is necessary. If there are two lines, make adjustment according to the method of adjustment below.

Adjustment Method

As shown in the figure B, make screw adjustment until the lead wire from the video head from the angle index adjusting rod is strongly felt in the adjusting screw hole on the red or white left side. The right and left of the adjusting hole should be seen from the shaft side of the drum. Replay the alignment tape and turn the tracking control knob to right or left from the center click. Confirm that there is one longitudinal line of the monoscope when this is done. When the tracking control knob is turned clockwise (counterclockwise), and only one line appears, insert the angle index adjusting rod in the adjusting screw hole located to the left of the video head for the white (red) lead. Then make necessary adjustment and check if the longitudinal line of the monoscope has become one. Repeat this adjustment until the longitudinal line of the monoscope becomes one.

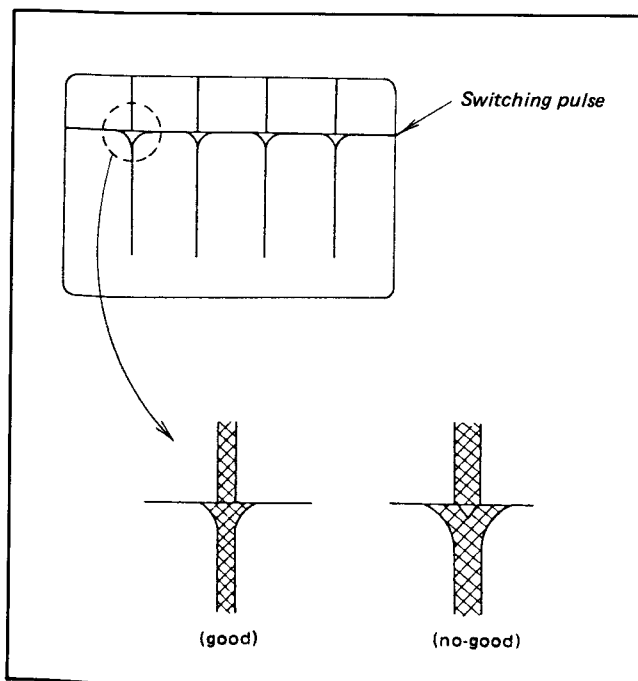


Fig. A.

Note: If the angle index adjusting rod is turned too much, the angle index of the video head may considerably go inaccurate. Therefore, care must be taken.

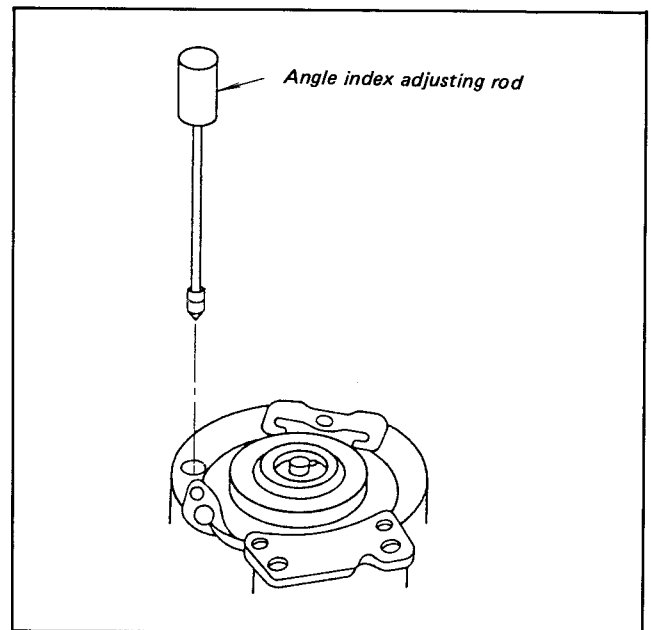


Fig. B.

3-2. DRUM ASSEMBLY REPLACEMENT PROCEDURE

3-2-1. Replacement of Drum Assembly

- (1) Remove the top cover, button plate, front panel assembly, and video PWB setscrews. See Fig. 3-1-1.
- (2) Put the equipment in a horizontal state and remove three screws ①. Then extract the connectors CN-1 and CN-2 with the servo/audio PWB turned toward you. Then reset the servo/audio PWB to the home position. Next, extract CN-1, 2, and ③ of the function PWB, remove two screws 2 and three screws ③. Now lift the system control PWB and remove three drum setscrews ④.

Note: If the hole position of screws ④ does not match at the time of drum assembly mounting, be certain to set the hole position with two screws ④ mentioned in item (6) below.

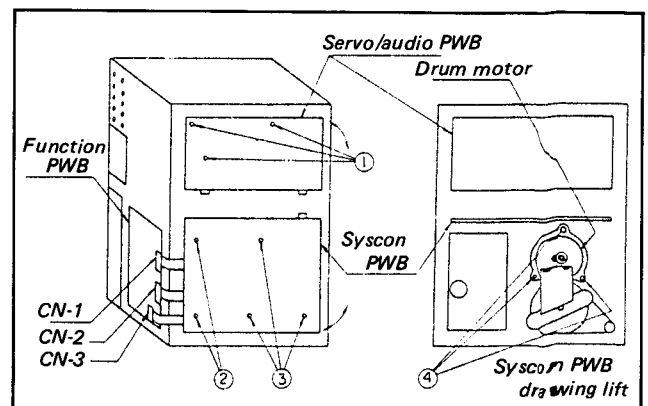


Fig. 3-1-1.

See Fig. 3-1

- (3) Return the equipment back to the original state, open the video PWB, and remove the shield cover using a soldering iron. Then cut the cable clamp, after which drum connectors (red ①, white ②, or a total of two) should be removed.
- (4) Remove screws ③ and dismount the heater.
- (5) Remove the connector cable clamp fitting for CN-1 and CN-2, connected to the servo/audio PWB. Then cut the cable clamp and remove the connector cable.
- (6) Remove two screws ④ and dismount the drum assembly.

Note: The equipment which uses three spaces underside of the drum assembly should employ spacers in the home position once again after mounting the drum assembly in.

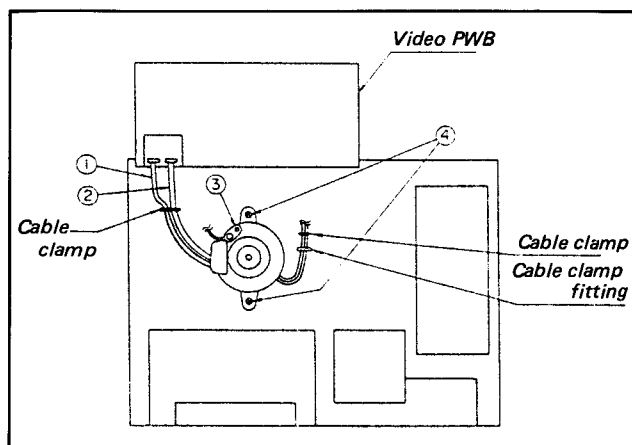


Fig. 3-1.

- (7) Mount parts in reverse order of items (6) to (2) complete the procedure of item (1). Tighten two drum setscrews ④ using a hexagon screwdriver. The screws mentioned in item (6) should be tightened by use of a ⊕ screwdriver.
- (8) Adjust tape path and ACE assembly position. (Refer to 3-16-1 and 3-16-4.)
- (9) Adjust the drum servo system. (See 7-3-1.)
- (10) Adjust slow servo system. (See Fig. 4.)
- (11) Mount parts in reverse order of item (1) above.

○ Necessary Tools

- ⊕ screwdriver
- – screwdriver
- Hexagon screwdriver
- Knippers
- Tape flow mirror
- Oscilloscope
- Filament tape
- Soldering iron

○ Necessary Parts

- Drum assembly 1
- Cable clamp 2
- Spacer 3 (spare)
- Double sems M4 x 8 screw . . . 2

3-2-2. Replacement of Drum Motor

- (1) Dismount the drum assembly from the equipment.
- (2) Cut the cable clamp ① with knippers, and remove the motor (red, 2 pcs). Remove PG (black connector) cable. Next, remove screw ② and then dismount the cable clamp ① and holder ③.
- (3) Remove nut ④ and washer ⑤ using a box screwdriver.
- (4) Alternately and equally loosen the motor setscrew ⑥ and dismount the motor (with the stator ⑦ and rotor ⑧ in the fitted state) and the tape holders ⑨, ⑩.
- (5) Mount parts in reverse order of disassembly from items 1 to 4.

But mount the motor with the motor rotor and store in the assembled state. In this case, be certain to alternately and equally tighten motor setscrews ⑥. Alos, tighten the nut ④ using a box screwdriver.

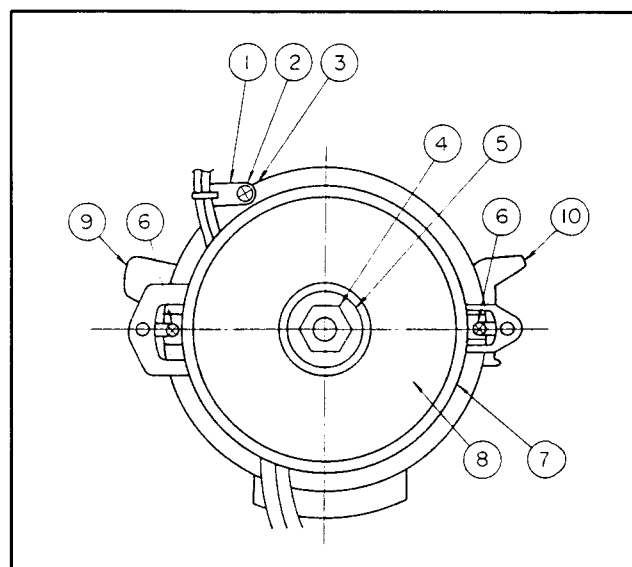


Fig. 3-2.

○ Necessary Tools

- ⊕ screwdriver
- Box screwdriver (box M4)
- Knippers

○ Necessary Parts

- Cable clmap x 1

3-3. REPLACEMENT OF CAPSTAN DC MOTOR

- (1) Stand the machine on its left side and remove the SYSCON printed wiring board.
- (2) Remove the DC motor from the DC motor bracket, following steps 1 and 2 shown in Fig. 3-3.

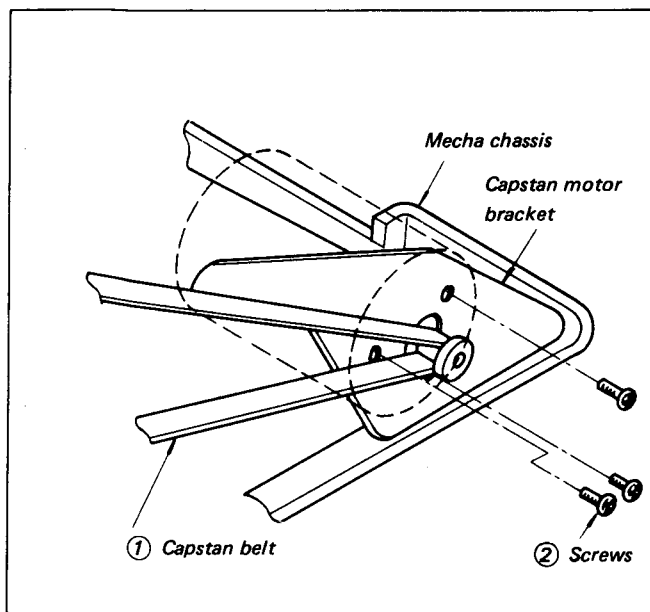


Fig. 3-3. Replacement of DC Motor (1)

- (3) After replacement, make the following adjustment.
 - Capstan free speed adjustment

3-4. REPLACEMENT AND ADJUSTMENT OF TENSION REGULATOR ARM PLATE ASSEMBLY AND TENSION REGULATOR BAND ASSEMBLY

The tension regulator arm replacement must be done carefully, following the procedure below, because the tape interchangeability is much affected by the tension regulator arm operation.

3-4-1. When Tension Regulator Band Assembly is Replaced

- (1) The tension regulator band assembly can be removed after removing screw ① and hook ② shown in Fig. 3-4.
- (2) Perform the tension regulator FWD position adjustment described below after the replacement.
 - (i) Place the machine into the STOP mode without an inserted cassette.
 - (ii) Set up the PLAY mode.
 - (iii) Move the brake band in the direction of an arrow as shown in Fig. 3-4 and tighten the screw at the position where state shown in (A) can be set up.

- (iv) Perform the FWD back tension adjustment after replacement.

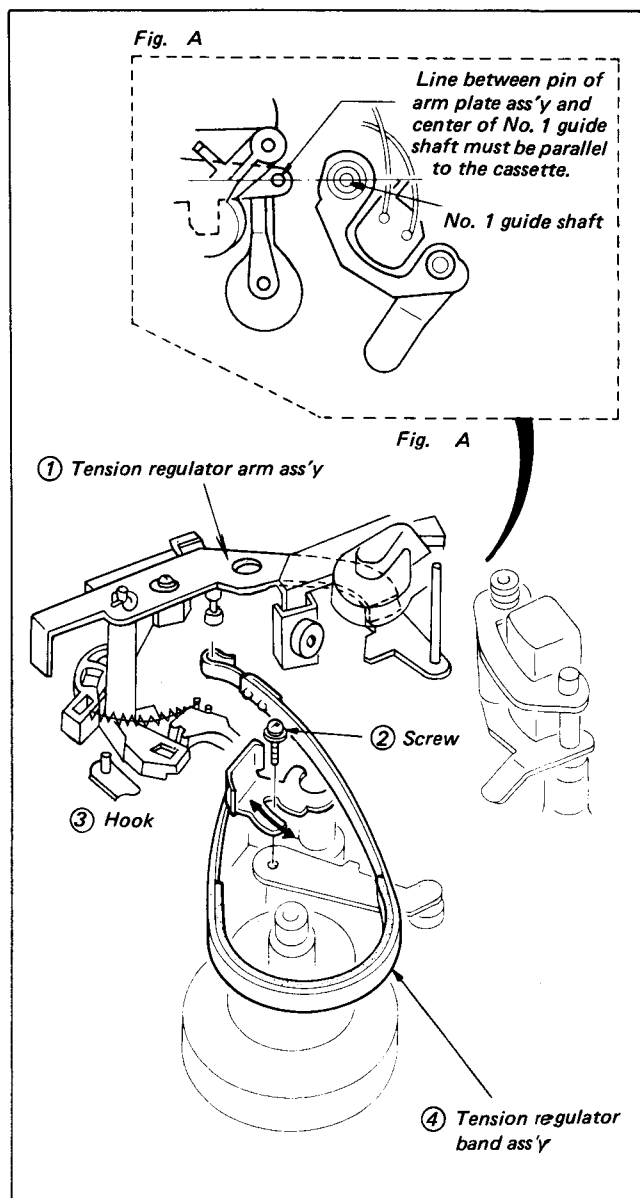


Fig. 3-4.

3-4-2. When Tension Regulator Arm Plate is Replaced

- (1) Set up the FWD mode.
- (2) Loosen screw ③ securing the tension regulator band ass'y ④ shown in Fig. 3-5, move the ass'y in the direction of an arrow, and temporarily tighten the screw ③ at the position where the state of view (C) is established.
- (3) Insert a standard blade-tip screwdriver into section (D) and adjust the clearance between the release link (1) assembly ⑥ and tension regulator arm assembly ⑦ until it is 0.5 to 1.0 mm, and also the clearance A is 0.1 to 3 mm. Then secure the section D using a screw ②.
- (4) Tighten a screw ③ as stated in 3-4-1 above.
- (5) After adjustment, make screw lock.

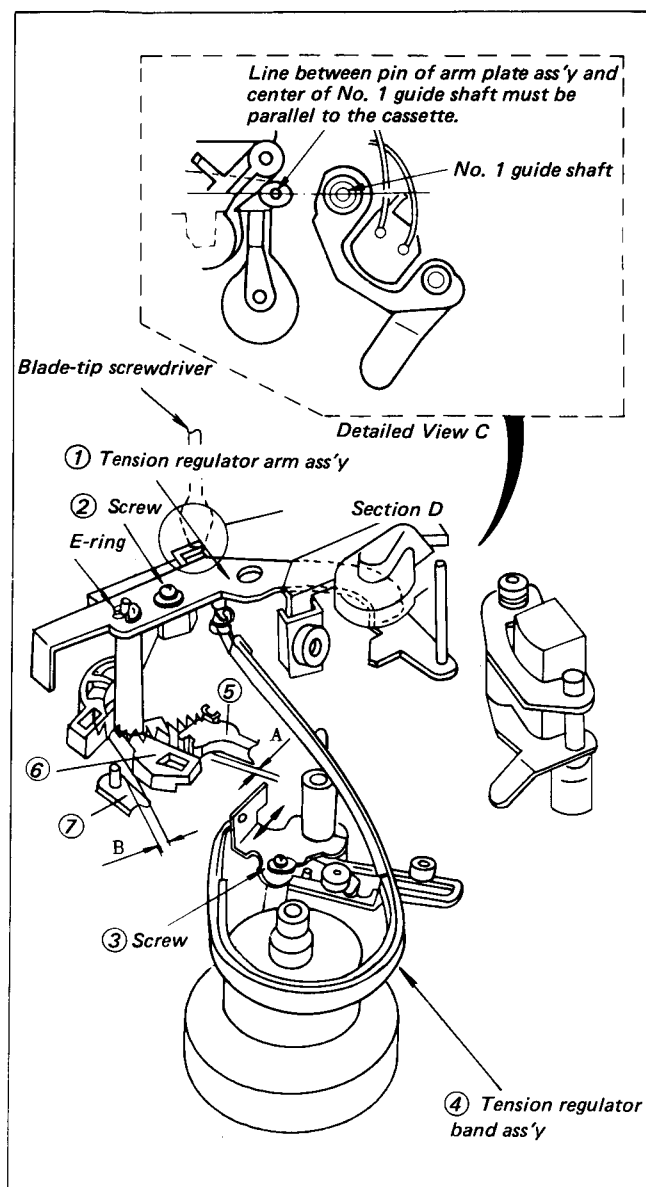


Fig. 3-5.

- (6) Play back the Monoscope segment of the alignment tape (KR5-2H). Loosen the lock screw and adjust screw "a" so that the RF waveform becomes flat (see the waveform in the tape path adjustment, Section 3-16-1) when the TRACKING knob is turned to the right and left from the flanges of guides ①, ②, and ③ shown in Fig. 3-6, and there is not a large tape curl at the guides.

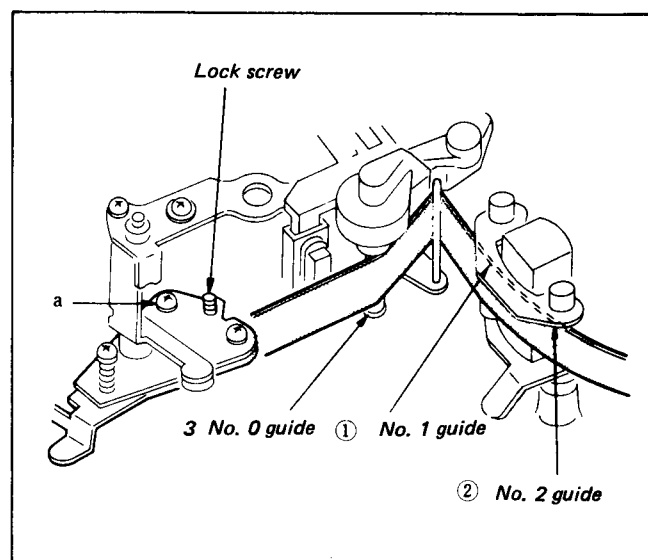


Fig. 3-6. Replacement and Adjustment of Tension Regulator Arm Plate Assembly (2)

- (7) After adjustment, confirm that there is not a large bending of the tape at each of the tension regulator guide pin section and the No. 0 guide section shown in Fig. 3-7. If bending is found, repeat Step 3.

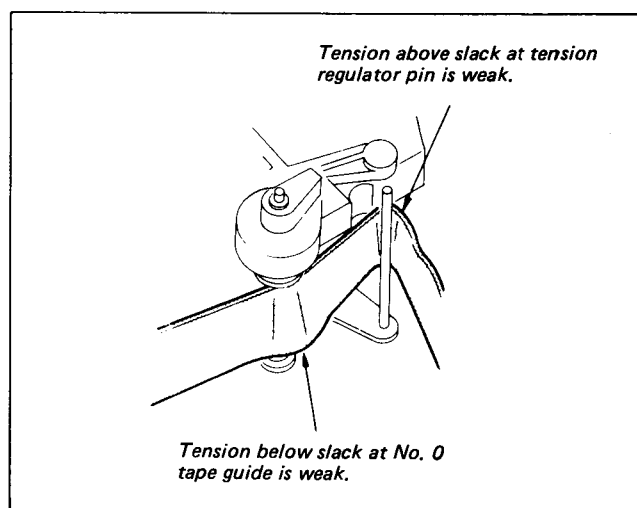


Fig. 3-7. Replacement and Adjustment (3) of Tension Regulator Arm Plate Assembly

3-5. REPLACEMENT OF CASSETTE-LIFT ASSEMBLY

- (1) Set up the unthreading state and remove the cassette-lift assembly by loosening four screws and one connector.
- (2) To install the cassette-lift assembly, do so by keeping taut the tension of the band brake shoe attached to the S tension regulator lever in the direction of an arrow shown.

Care should be taken to ensure that the band brake shoe is not caught in between the S reel table and the cassette-lift assembly.

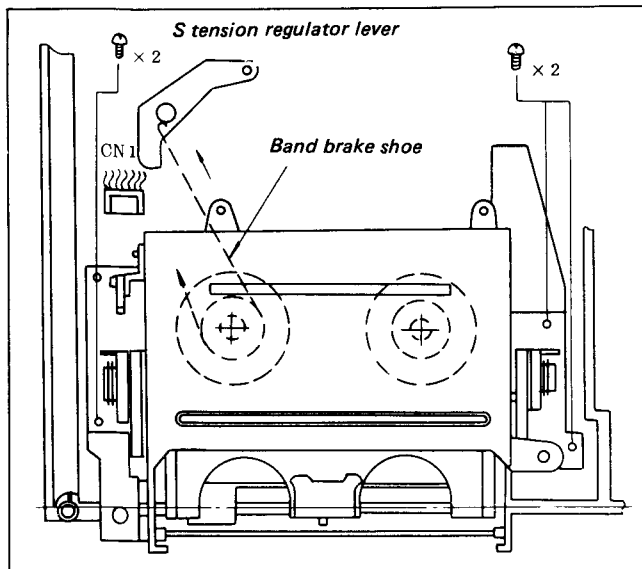


Fig. 3-8. Replacement of Cassette-Lift Assembly

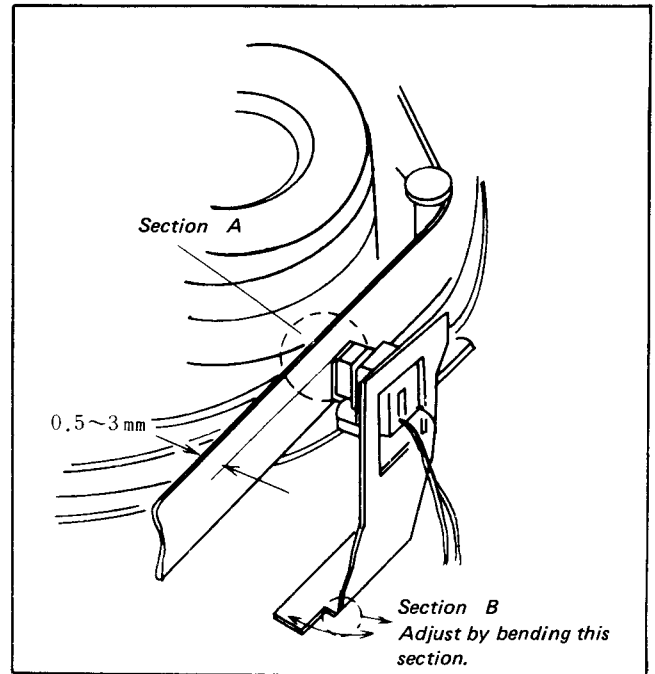


Fig. 3-10. Adjustment of Cassette Lift Bracket Position

3-6. ADJUSTMENT OF REEL TABLE HEIGHT

- Since the reel table height serves as the reference of the tape movement system, the height must be adjusted carefully after replacement of the reel table.
- (1) Measure the height of the reel table with a slide caliper prior to the removal of the old reel table. (See Fig. 3-8)
- (2) Place a new reel table, measure its height, and adjust height by adding or removing the adjusting spacer so that a difference in the height of the old reel table and the new reel table is within 0.1 mm. (See Fig. 3-9)

3-7. ADJUSTMENT OF CASSETTE LIFT BRACKET

- (1) When the cassette lift bracket is not in position, adjust the section (B) in the arrow direction, as shown.
- (2) Next when the cassette is put into and placed into a playback state, confirm that the specification (0.5 to 3 mm) in section (A) in the figure is met.

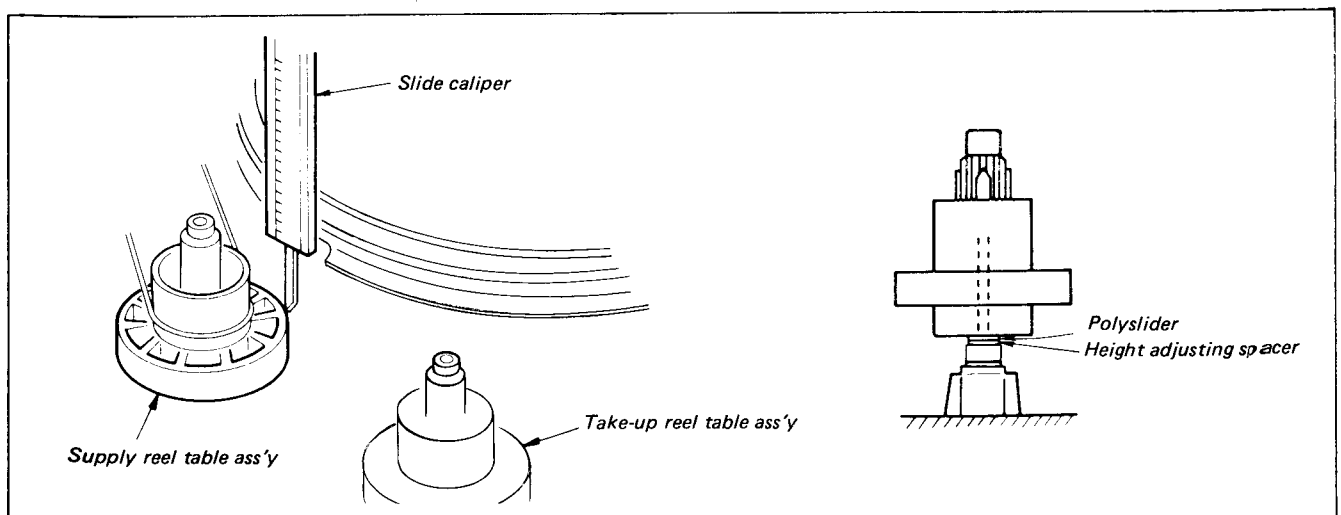


Fig. 3-9. Adjustment of Reel Table Height

3-8. REPLACEMENT AND ADJUSTMENT OF THREADING RING ASSEMBLY

- (1) Turn the threading ring to a point immediately before the threading completion position by hand.
- (2) Perform procedures ① to ③ shown in Fig. 3-11.
- (3) Remove the threading ring while moving the tension regulator arm assembly in the arrow direction by holding its lower section.

Note: Do not hold the upper section of the tension regulator arm while moving the assembly.

- (4) Perform the adjustment of No. 0 guide section assembly ② and ring roller unit assembly ③ after replacement.
 - (i) Perform procedure ③ of this section.
 - (ii) As to the adjustment of the roller unit assembly ③, perform adjustment, referring to detail view A in Fig. 3-11.

- (5) Perform the threading and unthreading several times and confirm the smooth movement of the threading ring.
- (6) Adjustment after the mounting of No. 0 guide section assembly.
 - (i) Play back the Monoscope segment of the alignment tape (KR5-2H).
 - (ii) Turn the TRACKING control knob so that the RF waveform is 2/3 of its maximum level. (See Fig. 3-25)
 - (iii) Turn the No. 0 guide shown in Fig. 3-25 counter-clockwise (↺) and then clockwise (↻) until the point where the RF waveform at the exit section becomes flat with small fluctuations, and then tighten the mounting screws.

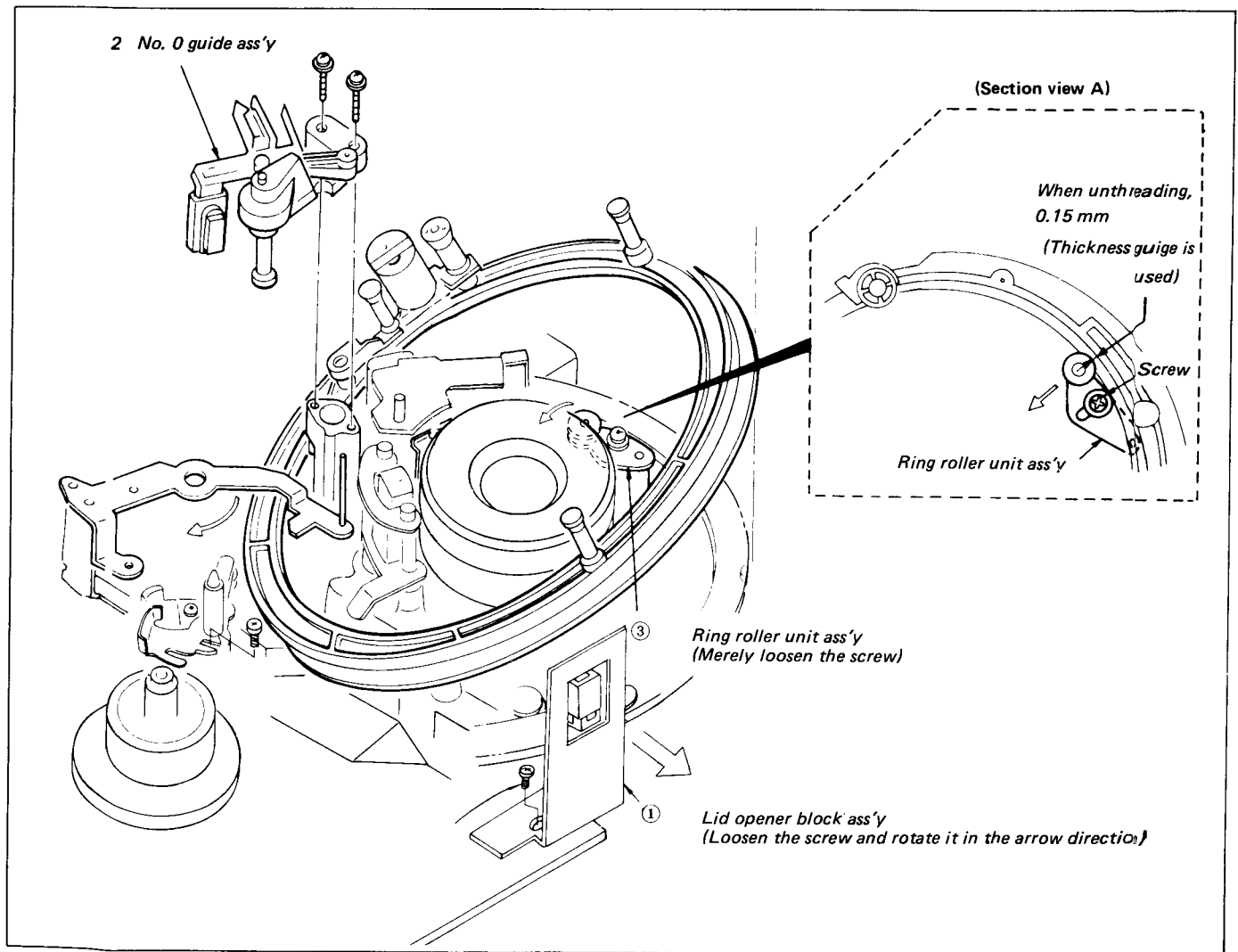


Fig. 3-11. Replacement of Threading Ring Assembly

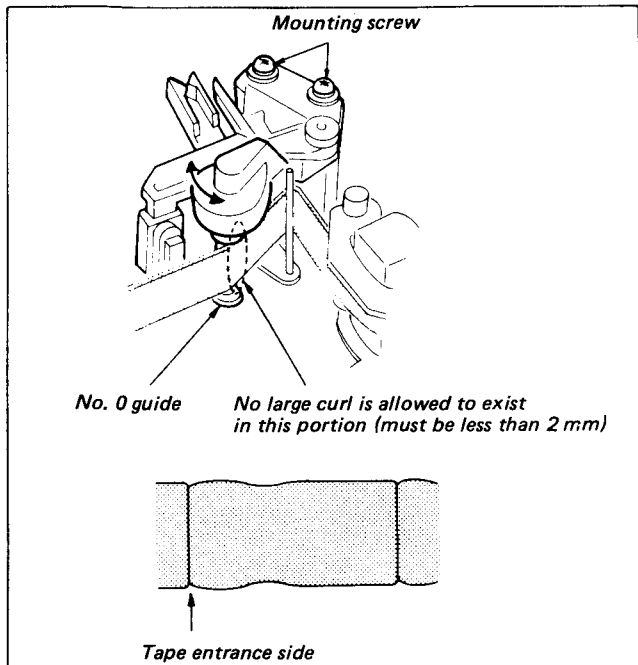


Fig. 3-12. Position Adjustment of No. 0 Guide Assembly Mounting

3-9. ADJUSTMENT OF PINCH ROLLER SOLENOID POSITION

- (1) Loosen the mounting screw shown in Fig. 3-13 in the FWD mode and move the pinch solenoid base to the left and right, to satisfy the standard value A, after which screw lock should be made.
- (2) Adjust the paralleling screw so that the pinch roller and the capstan shaft are visually held parallel in the FF/REW mode and then make screwlock.

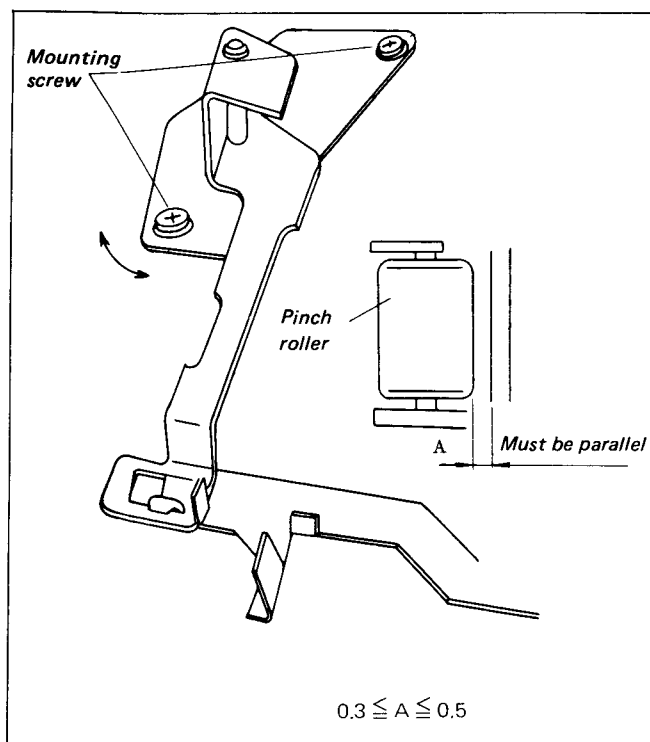


Fig. 3-13.

- (3) Tap the top and bottom of the table near the capstan entrance and confirm that the specification of Fig. 3-14 is satisfied.

If the specification is not satisfied, repeat the procedure 1 of Adjustment of Pinch Roller Solenoid Position in Section 3-9.

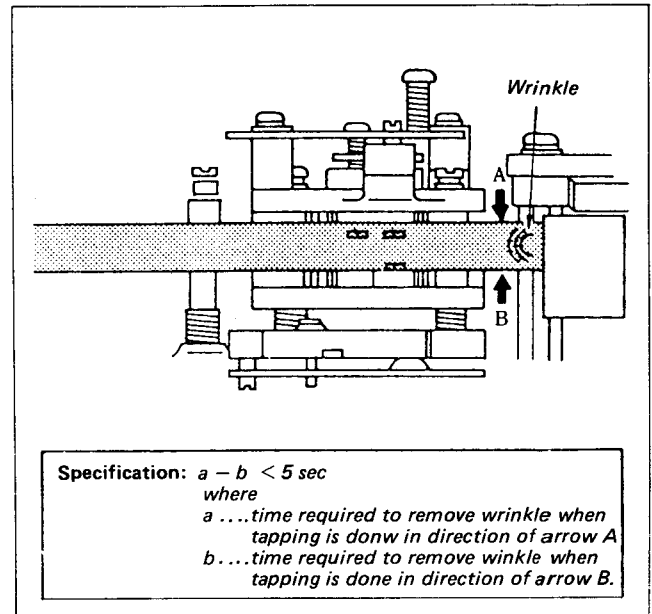


Fig. 3-14.

3-10. CHECK OF THREADING COMPLETION

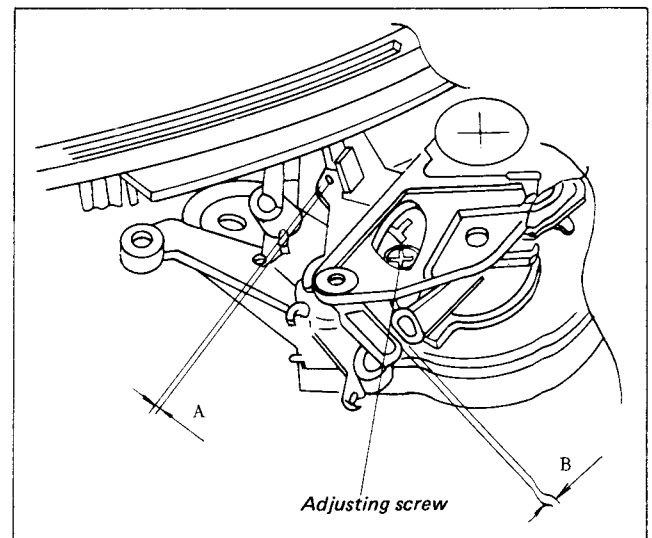


Fig. 3-15.

With the threading completed, there must not be a clearance A between the pin and the cam lock arm ②. (Must be in contact)
At that time, also there must not be a clearance B in between the cam lock arm ① and the base lock arm ②. (Must be in contact)
A, B = 0 (visual)

- Make a threading completion check.

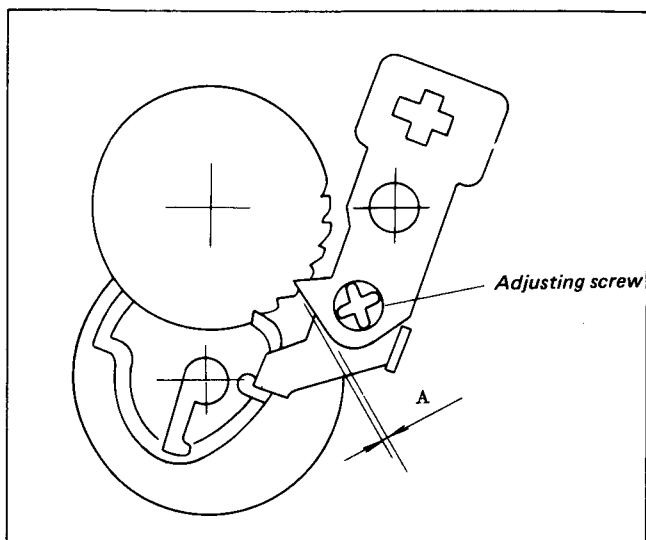


Fig. 3-16.

No gap is allowed to exist when in the FWD mode or the FF/REW mode. (Must be in contact)

A = 0 (visual)

Method of Adjustment	Remarks
1. In the FWD or FF/REW mode, the adjusting screw shown above is loosened and adjustment is then visually made to ensure that there is no clearance A.	Note: Do not screw lock.

- (6) Set up the PLAY mode.
- (7) Bring the sector type gauge toward the tape-up reel table at a speed of approximately 2 cm/sec (8 inches/sec) as shown in Fig. 3-17. Confirm that the gauge reading is within the specification.
If not, adjustment should be made with the torque volume (VR-3) on the SYSCON printed wiring board.

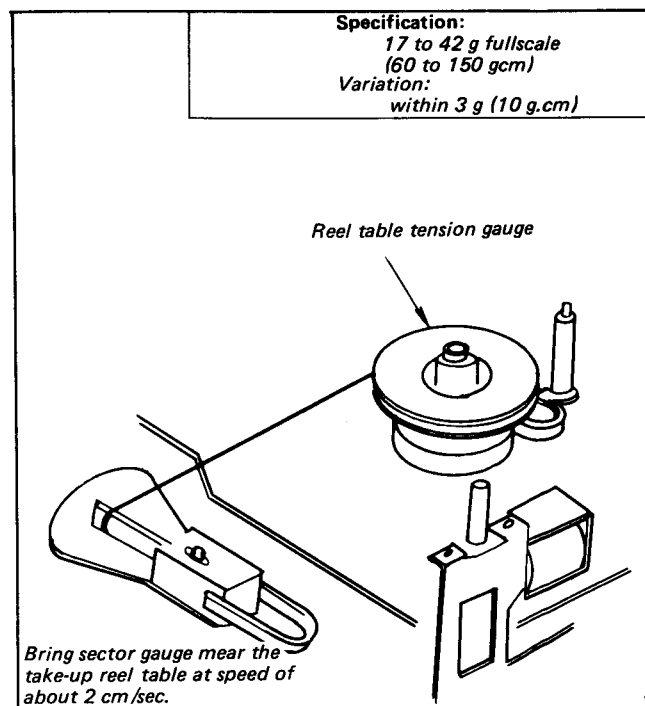


Fig. 3-17. Check of Take-up Torque

3-11. CHECK OF TAKE-UP TORQUE

- Because sufficient take-up torque cannot be obtained at the end of the tape if the take-up torque is below the specified value, tape slackness is caused at the capstan shaft point and sometimes the slack sensor operates.
 - The take-up torque tends to increase gradually due to aging.
- (1) Rewind the tape a little and select the PLAY mode (for the playback of the end of the tape) after the auto-stop at the tape end in the FAST FWD mode. Confirm that the tape runs without any slackness at the capstan shaft area. If there is tape slackness, perform the following adjustment.
 - (2) Remove Cassette-Lift.
 - (3) Clean the take-up reel table assembly, the FWD idler assembly, and the FWD belt with a piece of cloth dampened with alcohol.
 - (4) Attach the reel table tension gauge on the take-up reel table as shown in Fig. 3-16.
 - (5) Pull out the string from the reel table tension gauge about 30 cm (12 inches) and hook the sector type tension gauge (50 g fullscale) on the end of string.

3-12. CHECK OF CASSETTE EJECT TORQUE

- The tape is taken up by the take-up reel table in the cassette EJECT mode. The take-up reel table is driven via the belt by the DC motor, while the threading ring unthreads.
 - If the cassette eject torque is below the specification, only the threading ring performs the unthreading operation while the tape is not pulled back into the cassette, and the tape can be damaged.
- (1) Disconnect the belt from the threading motor SA.
 - (2) Attach the reel table tension gauge as shown in Fig. 3-18.
 - (3) Pull out the string of the gauge about 30 cm (12 inches) and hook the sector type gauge (50 g fullscale) on the end of the string.
 - (4) Set up the EJECT mode.

- (5) As shown in Fig. 3-18, bring the sector type gauge speed of approximately 2 cm/sec. and make sure that the reading of the gauge is within a range of 300 to 400 g. When necessary, adjust the torque using the torque adjusting volume (VR-4) on the SYSCON printed wiring board.

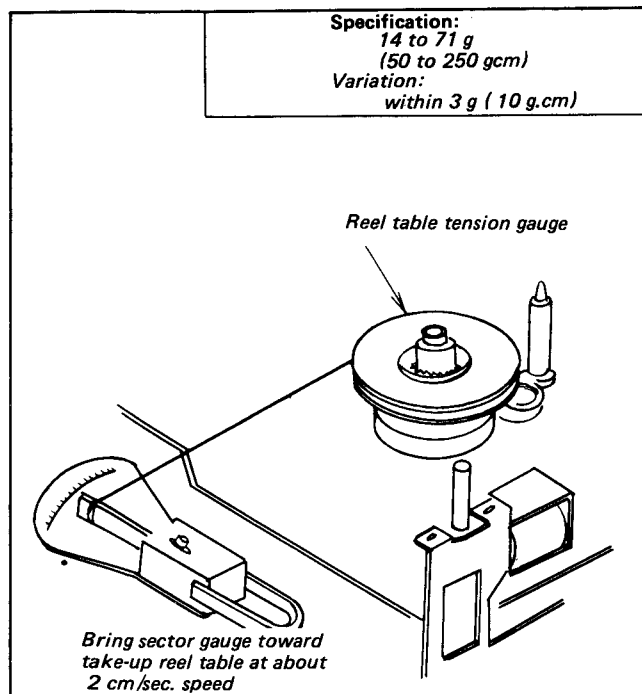


Fig. 3-18. Check of Cassette Eject Torque

Reel table ass'y Mode	Supply Side	Take-up Side
When Cassette Up (Cassette EJECT Mode)	Supply and soft brakes are ON.	Only take-up brake is ON.
Threading mode	Only soft brake is ON. (It is normal that the supply reel rotates a little, supplying tape.) Soft brake torque: 15 to 30 g.cm. Reel table rotational direction is CW (↻).	Free (tape is supplied from take-up side.)
STOP mode	Supply and soft brakes are ON. Reel table rotational direction CW (↻): 100 to 500 g.cm Reel table rotational direction CCW (↻): 40 to 130 g.cm	Only main brake is On. Reel table rotational direction CW (↻): 20 to 60 g.cm Reel table rotational direction CCW (↻): 60 to 500 g.cm
FF mode	Only soft brake is ON.	Free (Tape is taken up to take-up side.)
REW mode	Only soft brake is ON. (Tape is taken up to supply reel side.)	Free.
PLAY mode	Only FWD back tension brake band is ON.	Free (Tape is taken up to take-up side.)
REC PAUSE mode	Tension regulator band for supply brake, soft brake, and back tension is ON.	Take-up brake is ON.
Unthreading mode	Soft brake ON (threading brake ON)	Free (Tape is taken to take-up side.)

3-13. CHECK OF BRAKE TORQUE

- Brakes operate as below.

3-13-1. Check of Main Brake Operation

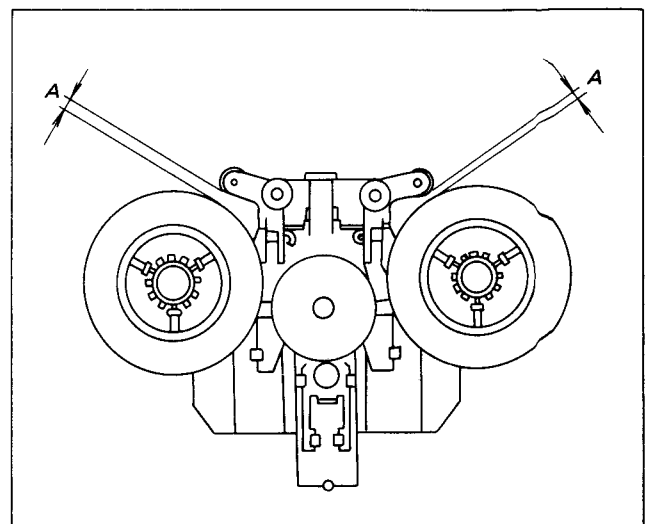


Fig. 3-19.

When the FWD mode and the FF/REW mode are selected, it should be confirmed that a clearance A between the reel table and the tension regulator arm is more than 0.5 mm.

Specification: A 0.5

Confirm that a clearance A between the reel table and the brake arm is more than 0.5 mm during the mode of threading and unthreading.

Specification: A 0.5

3-13-2. Check of Supply Brake and Take-up Brake Torque

- (1) Set up the STOP mode without the cassette. (See Fig. 2-2)
- (2) Attach the reel table tension gauge to the take-up reel table as shown in Fig. 3-20 and hook the sector type gauge (100 g fullscale) to the end of the string. Pull the sector type gauge at a speed of about 2 cm/sec and observe the gauge reading.

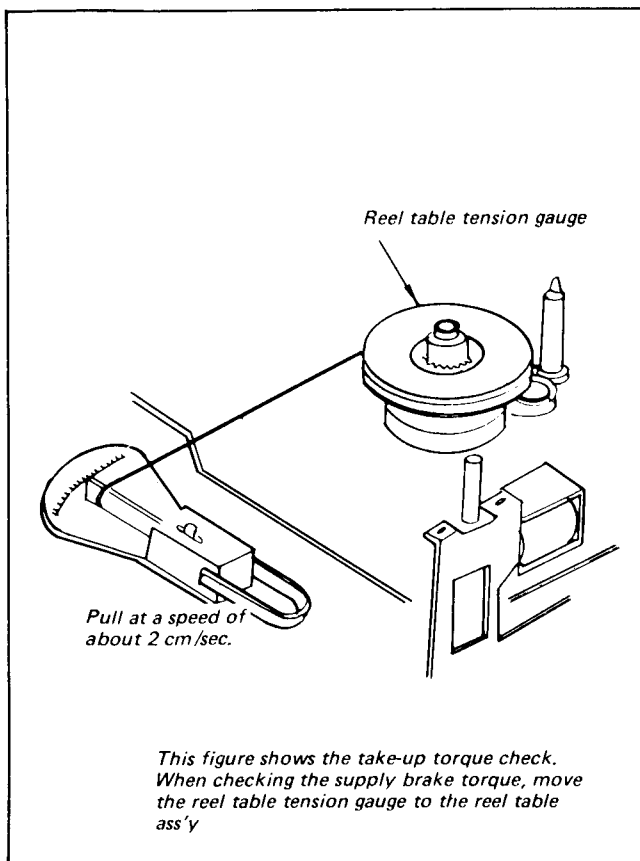


Fig. 3-20. Check of Supply and Take-up Brake Torque

Specifications:

- When supply reel table ass'y rotates CW (↻):
52 to 1050 g.cm (Scale value is 15 to 200 g)
- When supply reel table ass'y rotates CCW (↺):
35 to 350 g.cm (Scale value is 10 to 100 g)
- When take-up reel table ass'y rotates CW (↻):
35 to 350 g.cm (Scale value is 10 to 100 g)
- When take-up reel table ass'y rotates CCW (↺):
52 to 1050 g.cm (Scale value is 15 to 300 g)

3-13-3. Check and Adjustment of Soft Brake Torque

- (1) Mount the reel table tension gauge on the supply reel table as shown in Fig. 3-21 and hook the sector type gauge (50 g fullscale) to the end of the string of the tension gauge.
- (2) Set up the FF mode. Then pull away the sector type gauge at a speed of about 2 cm/sec. and check that the gauge reading is as specified.
If the specification is not met, the spring tension should be adjusted by moving the position of spring hook in the direction of an arrow.

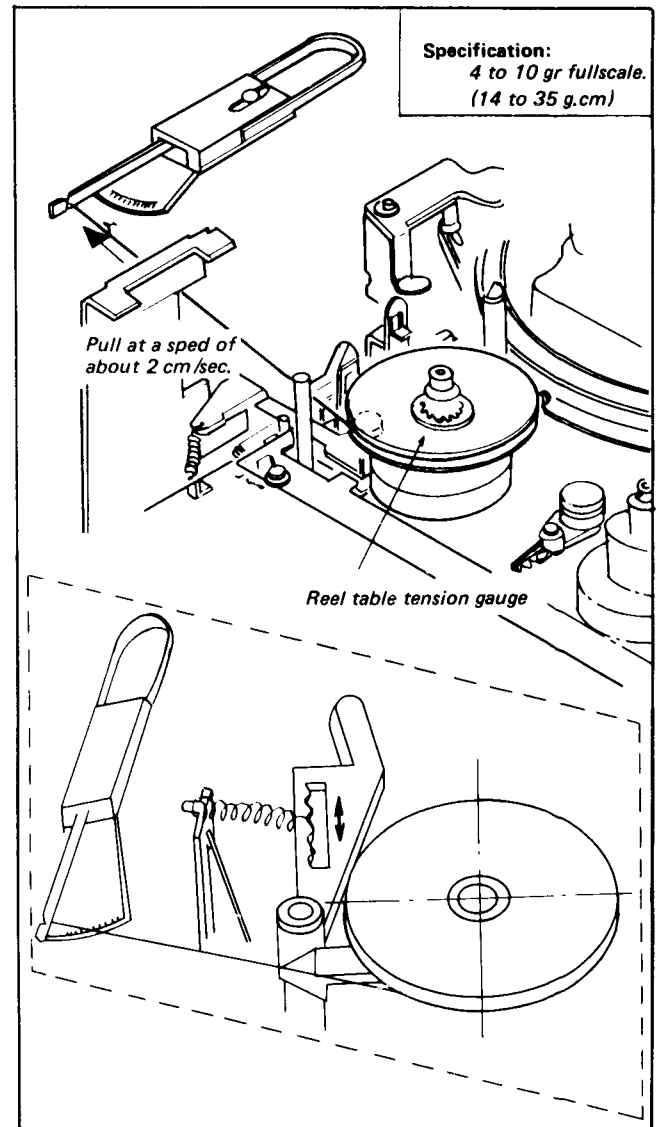


Fig. 3-21.

3-14. REEL TABLE TAKE-UP TORQUE

Take-up torque in the picture search mode.

- (1) CUE mode
Mount the reel table tension gauge (66 mm dia.) on the take-up reel table as shown in Fig. 3-22, hook a rod type tension gauge (300 g fullscale) to the tip-end of the gauge,

and press the CUE button to check the reading when the tape is taken up at a speed of about 2 cm/sec.

Specification: 230 gr
(800g.cm)

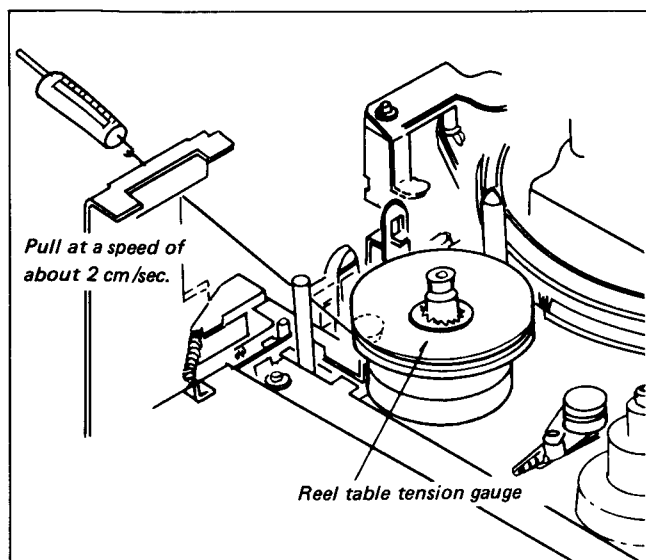


Fig. 3-22. Reel Table Take-up Torque

- (2) In REVIE mode
Mount the reel table tension gauge on the supply reel table and make much the same measurement as (1) above.

Specification: 230 g
(800 g.cm)

When the measured result is not within the specification, make adjustment using SERVO/AUDIO printed board VR11. (Common to Cue and Review) (PWV-421)

3-15. ADJUSTMENT OF FWD BACK TENSION

- The ideal measurement of FWD back tension is to measure it under the same condition as during the actual tape running state. The simple measurement procedure of the FWD back tension is described here. The measurement error due to the different measurement procedure is corrected in the specification.
- (1) Set up the STOP mode without the cassette. (Refer to Section 2-2)
 - (2) Place the FWD back tension jig on the supply reel table assembly and thread the tape as shown in Fig. 3-23. Hook the sector type gauge (100 g fullscale) to the end of the tape.

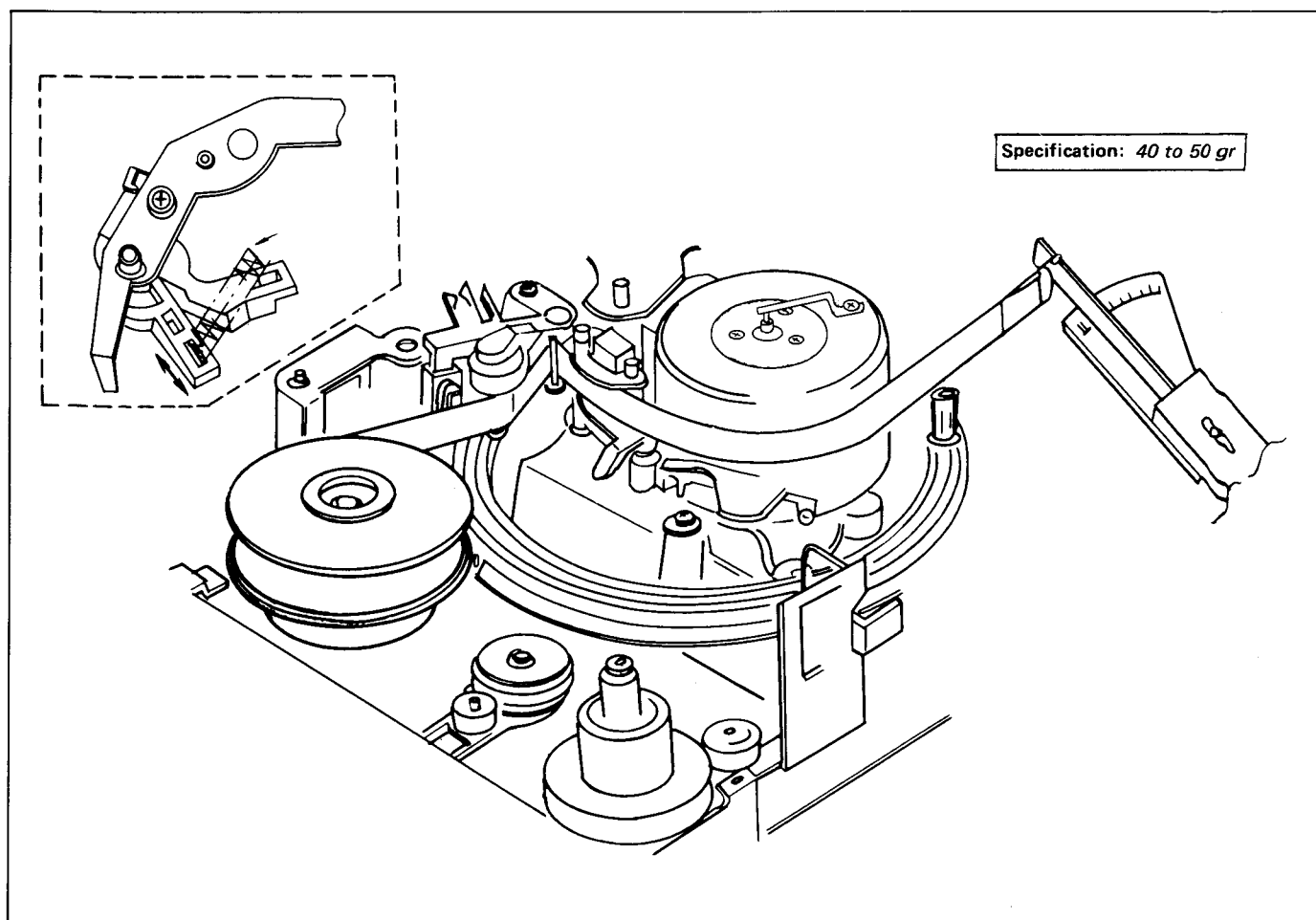
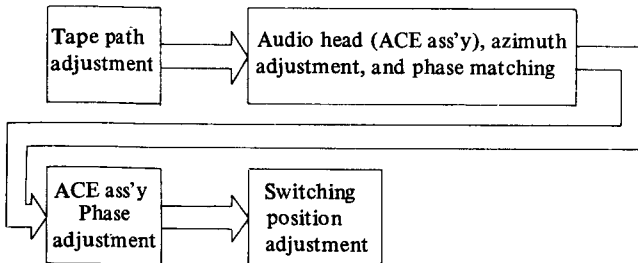


Fig. 3-23. Adjustment of FWD Back Tension

- (3) Set up the PLAY mode.
- (4) Pull the sector type gauge at a speed of approximately 2 cm/sec and confirm that the gauge reading is within the specification. If not, perform Step 5.
- (5) Adjust the spring hook position of the BT spring by moving it in the direction of an arrow.
- (6) Repeat Steps 3, 4, and 5.

3-16. ADJUSTMENT OF TRACKING

- To make tracking; adjustment, proceed as follows:



[Preparation]

- (1) Fixtures and Tools Required:
 - Alignment tape (KR5-2H)
 - Dual trace oscilloscope
 - Inspection mirror
 - Alcohol
 - Chamois
 - 3 mm flat tip screwdriver
- (2) Oscilloscope Connection

RF envelope waveform	: Video PWB TP-5
Switching waveform	
External trigger	: Video PWB TP-24
Audio out	
Video out	

(3) Location of Tape Guides

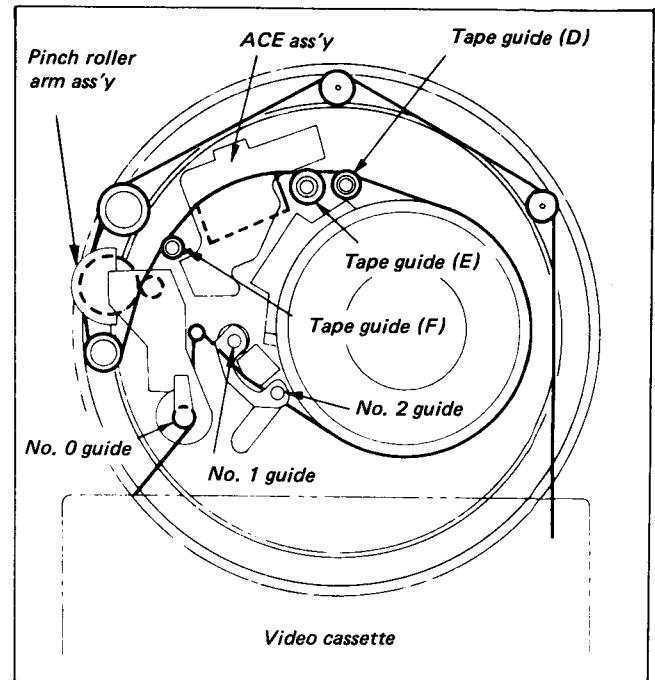


Fig. 3-24. Location of Tape Guide

3-16-1. Adjustment of Tape Path

- This adjustment may largely affect the interchangeability of tape and image quality. So, the utmost care should be taken.
- (1) Clean the tape running surfaced (tape guide, drum, capstan, and pinch roller) using a clothing cloth wetted with alcohol.
 - (2) Connect the oscilloscope to the video PWB, TP-5, and the external trigger to TP-24.
 - (3) Select the PLAY mode for the monoscope section of the alignment tape (KR5-2H).
 - (4) Confirm that the RF output waveform envelope on the oscilloscope screen increases and decreases, while remaining flat, when the TRACKING control knob is turned to the left and the right from its center detent position.
If the RF waveform does not increase or decrease while remaining flat, follow Step 6 for necessary adjustment.

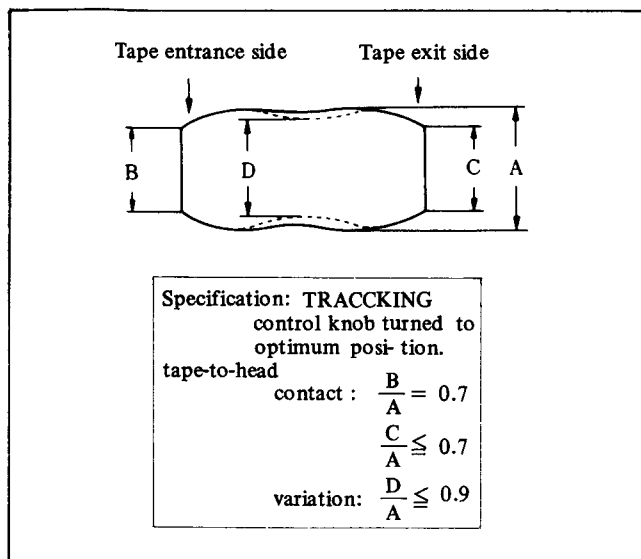


Fig. 3-25. Adjustment of Tape Path

- (5) Turn the TRACKING control knob to set it at the maximum RF output waveform. Confirm that the RF output waveform variations and contact meet the specification given in Fig. 3-25 at that time.
 If these do not meet the specification, adjust by following Step 6.

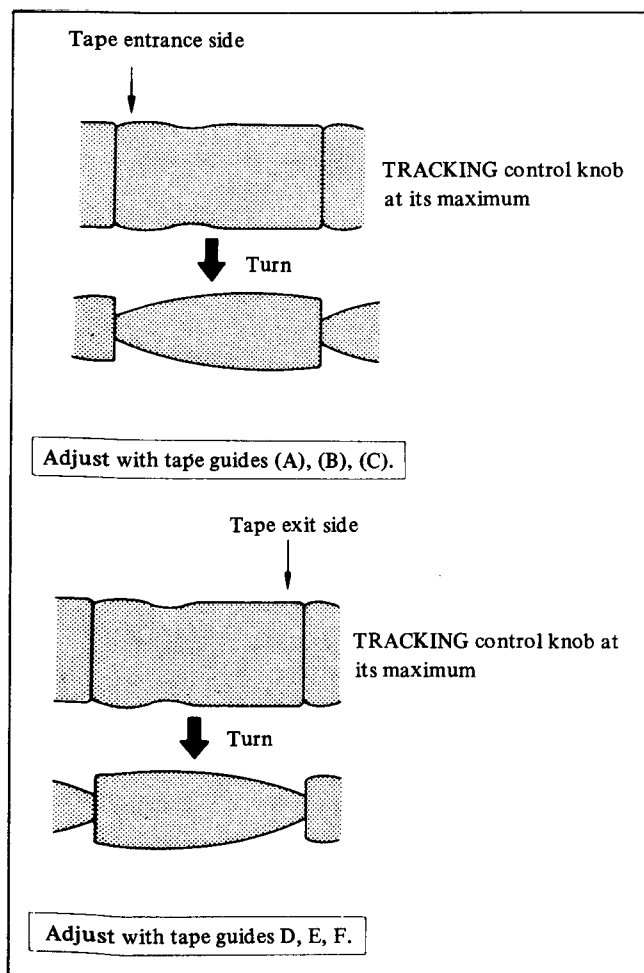


Fig. 3-26. Adjustment of Tape Path

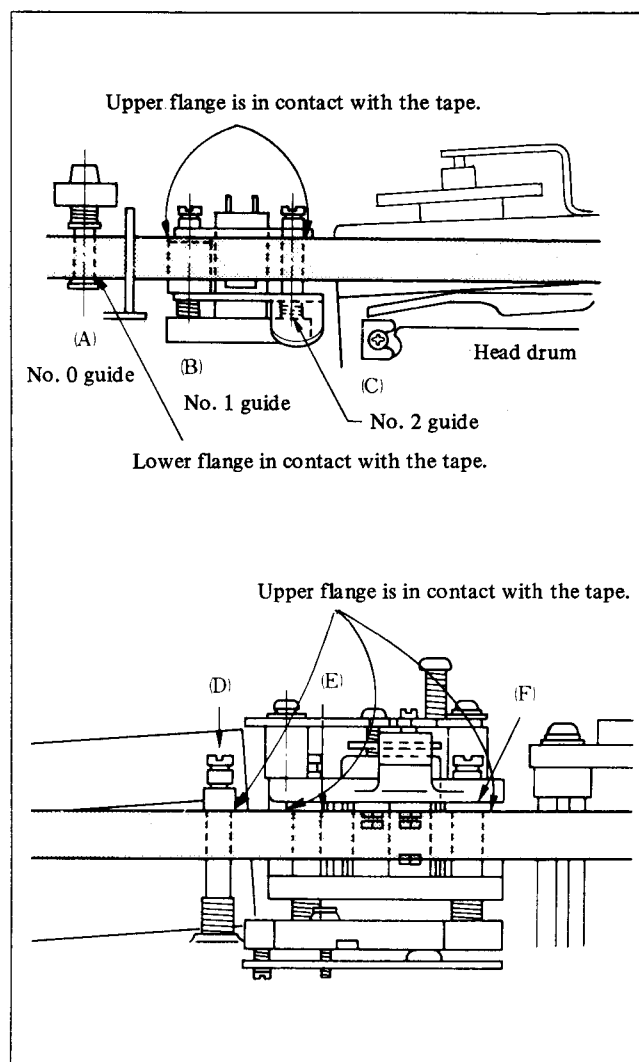


Fig. 3-27. Adjustment of Tape Path

When the waveform at the entrance side is not flat as shown in Fig. 3-27 for the clockwise and counterclockwise turning of the TRACKING control knob from center, detent position, adjust the heights (A), (B), and (C) of tape guides (0), (1) and (2). When the waveform at the tape exit side is not flat, adjust the height of the tape guides (D), (E) and (F). The height adjustment must be performed so that the tape contacts with the drum heads, and there is a minimum curl (not more than 2 mm) at the flange of each tape guide, the upper or lower flange contacts with the tape as shown in Fig. 3-27, and the RF waveform is flat.

The construction of the ACE assembly enables the assembly to be adjusted so that its top plate is perpendicular to the fact of the moving tape as a whole, but this "tilt" adjustment is not necessary except after ACE assembly replacement. Since tape guide (D) regulates the movement of the tape around the drum exit, raise tape guide (D) about 0.5 mm before adjustment of the tape path on the exit side. Then lower tape guide (D) to the point immediately before the RF waveform varies, and with less than 2 mm curl after tape path adjustment.

3-16-2. Adjustment of Exit Side Tracking After ACE Assembly Replacement

- (1) The ACE assembly can be removed if three screws shown in Fig. 3-28 are removed.

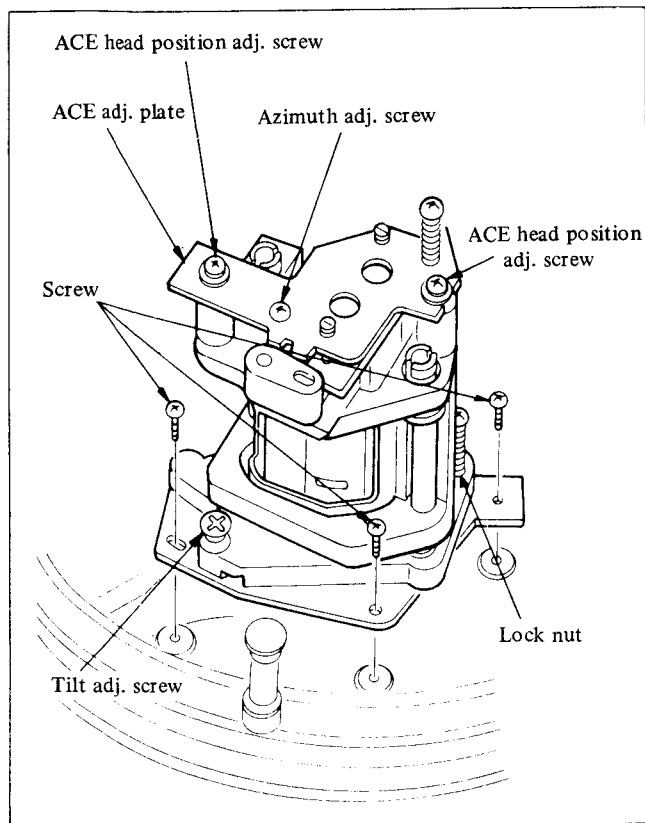


Fig. 3-28. Removal of ACE Assembly

- (2) Perform the adjustment, following Step 3 onward after replacement.
- (3) Raise the tape guide (D) shown in Fig. 3-27 by 0.5 mm. (Move the nut one turn)
- (4) Play back the 1 MHz segment of the alignment tape (KR5-2H). Confirm that the RF wave output (see Fig. 3-25) satisfies the specification and there is a minimum curl (not more than 2 mm) on the tape edge contacting the tape guide. Confirm that the RF waveform varied from the flat state when the tape guides (E) and (F) are raised, and adjust the heights of the tape guides so that the waveform output becomes flat.
- (5) When the waveform does not vary if the tape guides (E) and (F) are raised in Step 4 or when the waveform does not become flat if the tape guides are lowered, perform the adjustment, following the procedure below.
 - (i) Loosen the lock nut shown in Fig. 3-28.
 - (ii) Turn the zenith adjusting screw counterclockwise (↺) a little more than 30 degrees and turn it clockwise (↻) until the screw returns to the point 30 degrees counterclockwise from its original point.
 - (iii) Perform Step 4 again. If the specification is not satisfied, perform Step 5 again. Since the ACE assembly was adjusted perpendicularly when assembled at the factory, do not turn the zenith adjustment screw more than 60 degrees to the right and left from the original position.

- (iv) After the adjustment, tighten the lock nut until a slight resistance for the tightening is left and confirm that the specification in Step 4 is satisfied.
- (6) When there is an edge curl at the tape contacting the tape guide in
 - (i) Loosen the lock nut shown in Fig. 3-28.
 - (ii) Tighten the zenith adjusting screw clockwise only 15 degrees.
 - (iii) Perform Step 4 again. If the specification is not satisfied, perform Steps 5 and 6 again, but do not turn the zenith adjusting screw to the right and left more than 60 degrees from the original position.
 - (iv) Tighten the lock nut until a slight resistance is felt after adjustment. Confirm that the specification in Step 4 is satisfied.

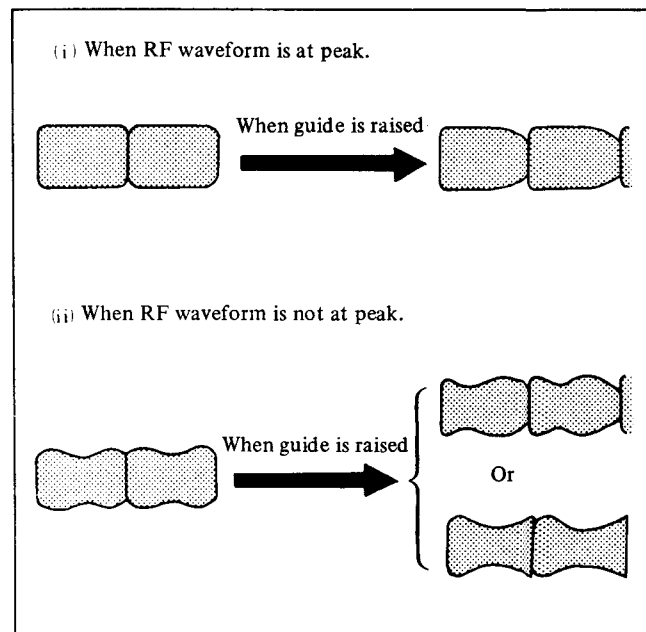
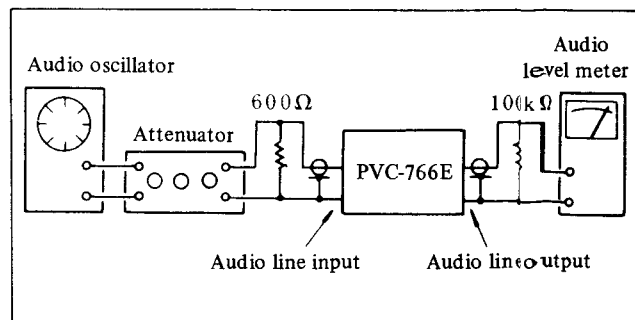


Fig. 3-29. Adjustment of Exit Side Tracking After Replacement of ACE Assembly

3-16-3. Adjustment of Audio Head (ACE Assembly) Azimuth



- (1) Terminate the audio line output terminal with a 100 kΩ resistor and connect an audio level meter to it.
- (2) Play back the 5 kHz audio signal of alignment tape (KRr-1S, Z).
- (3) Adjust the azimuth adjustment screw on the audio head for a maximum VTVM reading. (See Fig. 3-28)

3-16-4. Adjustment of ACE Assembly Position

- This adjustment consists of mechanical head mounting position adjustment and the electrical adjustment of tracking control center.
 - To make this adjustment, first adjust the tracking control center and then adjust the mechanical head mounting position. If this adjustment is done in reverse order, track shift may be caused because of interchangeability.
- (1) Connect the oscilloscope to the video PWB TP-5 and external trigger video PWB TP-24.
 - (2) Play back the alignment tape (KR5-1S, Z) to confirm that an image appears.
 - (3) Turn the tracking control knob and confirm that the RF output waveform level becomes its maximum at the center clock position. When the specification is not satisfied, follow the step 4 and the reset.
 - (4) Adjust the tracking control center. (See 4-4 (4).)
 - (5) Set the tracking control knob in the center click position and play back Alignment tape (KR5-1Z) monoscope.
 - (6) Loosen the ACE head position adjusting screws (2 pcs.) as shown in Fig. 3-30 and make adjustment until the RF output waveform becomes its maximum with the notch of section A moved.
- Note:** In 5-1Z of item (6) above, the points at which the envelope becomes maximum are four, namely, (a), (b), (c), and (d) in the figure below, but do not fail to adjust the point (b).
- (7) Play back the alignment tape (KR5-1S, Z) and confirm that an image appears.
 - (8) Tighten the ACE head position adjusting screws.

Note: If the tracking cannot be achieved at the tracking control center using KR5-1S, be certain to adjust the knob to the point (a) or (c).

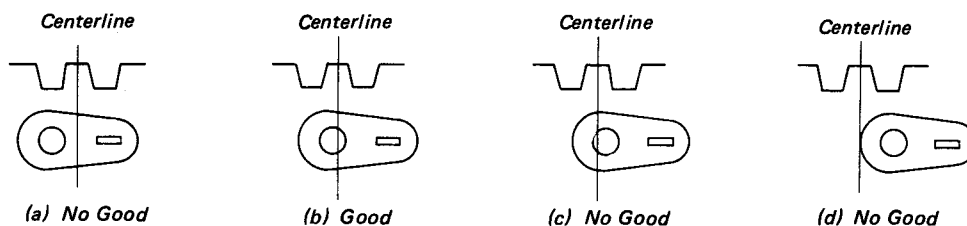
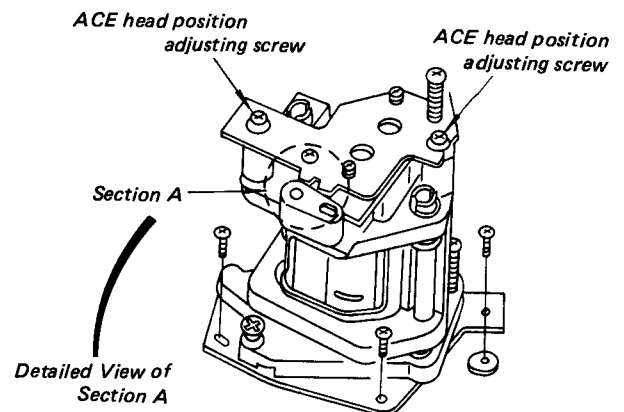


Fig. 3-30. ACE Assembly Position Adjustment

SECTION 4

ELECTRICAL ADJUSTMENT AND CHECK

4-1. REGULATOR (PWB-438) ADJUSTMENT PROCEDURES

4-1-1. Power Supply Adjustment and Check

(1) Measuring Instruments

Voltmeter (DC), Class 0.5 or higher, or a digital voltmeter with equivalent or higher accuracy.

(2) Adjustment and Check Items

- 2-1 REC 10 V Adjustment and Check
- 2-2 REC 12 V Adjustment and Check
- 2-3 EVER 12 V Adjustment and Check
- 2-4 -19 V Check
- 2-5 REC 32 V Check
- 2-6 FIP 1.7 V Check

(3) Adjustment and Check

Switch the VCR on, connect the voltmeter to the following measuring points, and adjust and check as follows.

	Output	Measuring Point	Adjustment	Rating	
2-1	REG 10 V	PWB-438 TP1-E	VR1	<ul style="list-style-type: none"> ○ Output level: DC 10 ± 0.2 V ○ Ripple: Less than 5 mVp-p 	0.3 A
2-2	REG 12 V	TP2-E	VR2	<ul style="list-style-type: none"> ○ Output level: DC 12 ± 0.2 V ○ Ripple: Less than 5 mVp-p 	1.1 A
2-3	EVER 12 V	TP3-E	VR3	<ul style="list-style-type: none"> ○ Output level: DC 12 ± 0.2 V ○ Ripple: Less than 5 mVp-p 	0.1 A
2-4	-19 V	TP4-E	—	<ul style="list-style-type: none"> ○ Output level: DC -19 ± 3 V 	10 mA
2-5	REG 32 V	TP5-E	—	<ul style="list-style-type: none"> ○ Output level: 31.5 ± 0.5 V ○ Ripple: Less than 0.1 Vp-p 	10 mA
2-6	FIP 1.7 V	TP6-TP7	—	<ul style="list-style-type: none"> ○ Output level: DC 1.7 ± 0.3 V 	80 mA

4-2. SYSCON ADJUSTMENT AND CHECK

(1) Measuring Instruments and Jigs

- (1) Oscilloscope
- (2) Digital voltmeter
- (3) Cassette tape (starting and ending parts)
- (4) Remote control unit RB-76E (see the attached diagram.)

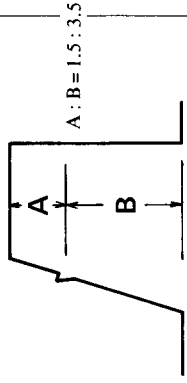
(2) Adjustment and Check Items

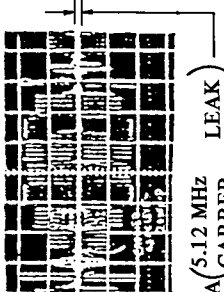
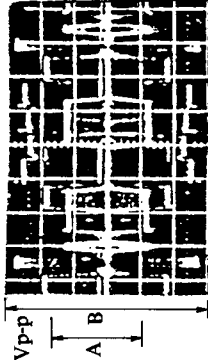
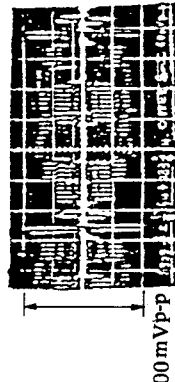
- (1) Power on
- (2) TV/VCR switching
- (3) Cassette insertion, loading
- (4) Eject operation (adjustment)
- (5) FWD/PAUSE (adjustment)
- (6) FF/REW
- (7) CUE/REVIEW
- (8) STILL ADJUST
- (9) Recording
- (10) End sensor (adjustment)
- (11) Counter memory
- (12) Takeup sensor
- (13) Dew sensor
- (14) Remote control (adjustment)

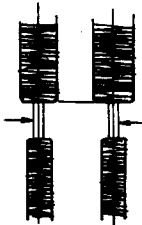
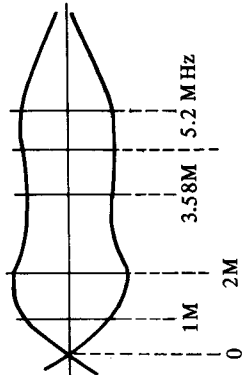
	Item	Adjustment/Check	Remarks
1	Power on reset	Push the power switch off and on three times, and confirm that operation is normal. (If so TV/VCR can be selected.)	Power On Indicator (Green Lamp) Light.
2	TV/VCR operation, indication	Off when power is turned on. Reversed when the TV/VCR button is pressed.	VCR lamp light.
3	Cassette Insertion, Loading	Check Cassette Insertion and Loading operation.	STOP and Visual mirror lamps light.
4	Eject operation (Press STOP button to stop.)	Adjustment. Connect the oscilloscope to TP4 and TP3 (GND) on Syscon PWB, and adjust VR4 so that the unloading reel motor voltage becomes 3 ± 0.3 VDC.	Only the check to be made during syscon adjustment.
5	FWD operation Pause operation (FWD)	FWD operation, indication Adjustment Connect the oscilloscope to TP4 and TP3 (GND) on Syscon PWB, and adjust VR3 so that the reel motor voltage in FWD mode becomes $2.1^{+0.1}_{-0}$ VDC. Check pause operation and indicator	If no FWD operation takes place, check the FWD sensor Take data with PP and if the voltage meets the requirement, adjust syscon independently.
6	FF operation REW operation	FF operation, indication REW operation, indication	
7	Cue operation (FF button pressed on in FWD mode) Review operation (REW button pressed on in FWD mode)	Check cue operation and indicator Check Review operation and indicator	FWD and FF lamps light. FWD and REW lamps light.
8	STILL ADJUST. operation	Check STILL ADJUST operation.	
9	REC operation	Check REC operation and indication and REC Safety.	If REC button is pressed when REC SAFETY switch is not on, cassette is ejected.
10	End sensor	Check End sensor (REW sensor) operation in the REW mode. Adjustment Connect the oscilloscope to TP2 and TP3 (GND) on Syscon PWB, and adjust VR2 so that 0.9 ± 0.1 VPP is obtained in REW mode. Check End sensor (FWD sensor) operation in the FWD or FF mode. Adjustment Connect the oscilloscope to TP1 and TP3 (GND) on Syscon PWB, and adjust VR1 so that the oscillation level in FWD or FF mode becomes 3 ± 0.3 VPP.	<ul style="list-style-type: none"> If the end sensor operates in the FWD, FF or CUE mode, the tape is automatically rewound. Neither FF nor FWD operation can be performed without oscillation. Neither REW nor REVIEW operation can be performed without oscillation.
11	Counter memory	When the memory switch is on, the REW mode must stop as the counter adds up from 0000 to 9999. When halted, the counter must read anywhere from 9995 to 9999.	Counter memory does not work if the repeat switch is on.
12	Takeup sensor	Check Takeup sensor operation	<ul style="list-style-type: none"> If the reel base stops when the tape is given in 1 second. Alarm: STOP indicator flashes. <ul style="list-style-type: none"> In the EJECT mode, alarm is given in 0.5 seconds.

	Item	Adjustment/Check	Remarks
13	Dew sensor	Check Dew sensor operation, and indicator Ground the terminal CN2-12 on the function PWB.	
14	Remote control	Adjustment Connect the oscilloscope to TP1 and TP-E (GND) on Function PWB, and adjust VR1 so that $7.6 \pm 0.05V$ is obtained. Check operation in each mode.	Tape cannot be ejected by remote control stop.

4-3. VIDEO ADJUSTMENT PROCEDURES

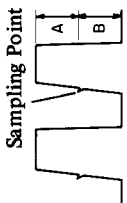
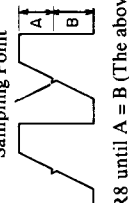
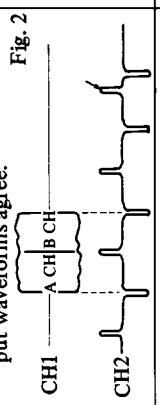
No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition
				Probe	V range H range	Trigger					
1	8.6 V Reg. adjustment	EE	Digital voltmeter	—	—	—	CHROMA/ P.A CN12-2 (TP401)		8.6 ± 0.05 V DC		
2	4.43 MHz VXO adjustment	EE VIDEO IN No connect	Frequency counter Oscilloscope	10:1	V: 20mV H: 0.2μsec	INT	CHROMA/ P.A TP302	CHROMA/ P.A T301	f: 4,433,619 ± 10 Hz		
3	4.43 MHz X'tal OSC adjustment	PB	— do —	— do —	— do —	— do —	— do —	CHROMA/ P.A T-302	f: 4,433,619 ± 10 Hz		
4	Video signal Output level check	EE PAL Color Bar Sig.	Oscilloscope	— do —	— do —	— do —	Y/PROCESS TP12	—	1.0 ± 0.2 Vp-p		
5	AFC adjustment	— do —	— do —	— do —	V: 50mV H: 10μsec	INT — Slope	CHROMA/ P.A TP303	CHROMA/ P.A VR301	 <p>A : B = 1.5 : 3.5</p> <p>Adjust VR301 until the lock point of the waveform showing at TP303 agrees with the slope center.</p>		
6	ACC adjustment	— do —	— do —	— do —	V: 20mV H: 10μsec	INT	CHROMA/ P.A TP207	CHROMA/ P.A VR202	Adjust VR202 until the level of the color signal showing at TP207 is 0.45 ± 0.02 Vp-p		

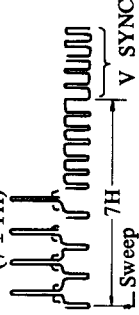
No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition
				Probe	V range H range	Trigger					
7	5.12 MHz carrier balance adjustment	EE PAL Color Bar. Sig.	Oscilloscope	10:1	V: 5mV H: 5μsec	INT	CHROMA/ P.A TP205	CHROMA/ P.A VR205	Adjust VR205 until the 5.12 MHz carrier component of the chroma signal showing at TP205 is lowered to the minimum. 		
8	Pilot burst level adjustment	— do —	— do —	— do —	V: 10mV H: 10μsec	— do —	CHROMA/ P.A TP206	CHROMA/ P.A VR203	Adjust so that the chroma signal showing at TP206 is as shown in Fig. $\frac{B}{A} = 170 \pm 10\%$ 		
9	Chroma REC level adjustment	— do —	— do —	— do —	— do —	— do —	CHROMA/ P.A TP203	CHROMA/ P.A VR204	Adjust VR204 until the chroma signal level showing at TP203 is $200 \pm 10 \text{ mVp-p}$ 		

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition								
				Probe	V range H range	Trigger													
10	Y-RF Sig. REC level adjustment	REC PAL color Bar Sig.	Oscilloscope	10:1	V: 5mV H: 0.5msec	EXT CHROMA/ P.A TP310	CHROMA/ P.A TP501	CHROMA/ P.A VR501	Adjust VR501 until the V. Sync. signal level showing at TP501 is 100 ± 10 mVp-p.  V.Sync. Signal 100 mVp-p										
11	PB RF Freq. response adj. 1) Freq. response • A-CH	KR5-2H Playback	— do —	— do —	V: 5mV H: 2msec	EXT CHROMA/ P.A TP310 ⊖ SLOPE	CHROMA/ P.A TP505	CHROMA/ P.A VR505	Adjust VR505 until the freq. response showing at TP505 as follows.  <table border="1" data-bbox="936 519 1090 813"><thead><tr><th>f</th><th>response</th></tr></thead><tbody><tr><td>3.6 MHz</td><td>100%</td></tr><tr><td>4.5 MHz</td><td>85 ± 15 %</td></tr><tr><td>5.2 MHz</td><td>85 ± 15 %</td></tr></tbody></table>	f	response	3.6 MHz	100%	4.5 MHz	85 ± 15 %	5.2 MHz	85 ± 15 %		
f	response																		
3.6 MHz	100%																		
4.5 MHz	85 ± 15 %																		
5.2 MHz	85 ± 15 %																		
	• B-CH	— do —	— do —	— do —	— do —	EXT CHROMA/ P.A TP310 ⊕ SLOPE	— do —	CHROMA/ P.A VR503											

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition
				Probe	V range H range	Trigger					
	2) Channel balance adjustment	KR5-2H Playback	Oscilloscope	10:1	V: 5mV H: 5mcs	EXT CHROMA/ P.A TP310 ⊕ SLOPE	CHROMA/ P.A TP505	CHROMA/ P.A VR504	Adjust VR504 until the CH-A and CH-B signals level showing at TP505 is equal. <div data-bbox="443 510 582 801" data-label="Diagram"> <p style="text-align: center;">A=B</p> </div>		

4-4. SERVO ADJUSTMENT PROCEDURES

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	
				Probe	V range H: range	Trigger					
1	Drum disc adjustment	REC PAL signal input	Oscilloscope	10:1	V: 0.2V H: 5mSec	EXT S/A TP2 + SLOPE	SERVO/A TP13	SERVO/A VR5	<p>Fig. 1</p>  <p>Sampling Point</p> <p>Adjust VR5 until A=B. (The above waveform must be synchronized by external trigger.)</p>		
2	Capstan disc adjustment	REC PAL signal input	— do —	— do —	— do —	— do —	SERVO/A TP14	SERVO/A VR8	<p>Sampling Point</p>  <p>Sampling Point</p> <p>Adjust VR8 until A = B (The above waveform must be synchronized by external trigger.)</p>		
4	Tracking control center adjustment	KR5-2H playback	Oscilloscope CH1 CH2	10:1 10:1	V: 10mV H: 5mSec VARIABLE Chop mode	EXT CHROM/ P.A TP310 — SLOPE	CHROMA/ P.A TP505 SERVO/A TP10	SERVO/A VR6 (ACE Head)	<p>1) Move the ACE adjusting panel to a point where RF output is reproduced in the phase relationship shown in Fig. 2.</p> <p>2) Adjust VR6 until CTL and RF output waveforms agree.</p> <p>Fig. 2</p> 	Set the tracking VR to the center where it clicks.	
5	CTL positioning	KR5-2H	Oscilloscope	— do —	V: 10mV H: 5mSec	— do —	CHROMA/ P.A TP505	ACE Head	<p>1) Make a fine adjustment of the ACE adjusting panel so that RF output will be maximum.</p>	Set the tracking VR to the center where it clicks.	

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	
				Probe	V range H range	Trigger					
6	RF switching position adjustment 1) PG (A) 2) PG (B)	KRS-2H playback	Oscilloscope	10:1	V:20mV H:50 μ Sec	EXT S/A TP1 - SLOPE	Y PROCESS TP12	SERVO/A VR1	Adjust VR1 so that the trailing edge of the vertical sync signal and the sweep start point will be 448 μ sec. Rating: 448 \pm 70 μ sec (7 \pm 1H)  Fig. 3 Adjust VR2 until the waveform is the same as shown in Fig. 3.	Set the tracking VR to the center where it clicks. - do -	
		- do -	- do -	- do -	- do -	EXT S/A TP1 + SLOPE	- do -	SERVO/A VR2			
7	Adjusting drum lock phase in record mode	REC PAL signal input	- do -	- do -	V:20mV H:50 μ Sec	- do -	Y PROCESS TP12	SERVO/A VR3	Adjust VR3 so that the trailing edge of the vertical sync signal and the sweep start point will be 448 μ sec. Rating: 448 \pm 70 μ sec (7 \pm 1H) (See Fig. 3.)		

4-5. AUDIO ADJUSTMENT PROCEDURES

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition
				Probe	V range H range	Trigger					
1	Playback adjustment 1) Frequency response adjustment	KRS-2H playback	Audio level meter	—	—	—	AUDIO LINE OUT (100K Ω terminated)	S/AUDIO VR202	5 KHz = 0 \pm 1 dB 333 Hz If the above specifications are not met when VR202 is turned fully clockwise adjust from its maximum position as follows. —5 \pm 0.5 dB After adjustment, output must be off when the CUE or REVIEW mode is selected.	(As viewed from the parts side)	
	2) Output level adjustment	KRS-2H playback (333 Hz)	— do —	—	—	—	— do —	S/AUDIO VR203			
2	EE output level check	E.E AUDIO IN 333 Hz, —10 dB	— do —	—	—	—	— do —	—	—5 \pm 3 dB		
3	Bias OSC check 1) Oscillator fre- quency check	REC	Frequency counter (with 10:1 probe)	—	—	—	Between full erase head's red lead termi- nal and GND	—	68 \pm 10 —8 KHz		
	2) Oscillation level check (1)	— do —	Oscilloscope	10:1	V:1V H:10 μ Sec	INT	— do —	—	35 \pm 5 Vp-p		
	3) Oscillation level chec (2)		— do —	— do —	V:0.5V H:10 μ Sec	— do —	Between full erase head's blue lead termi- nal and GND	—	11 \pm 3 Vp-p		

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition
				Probe	V range H range	Trigger					
8	Self-record/ playback distortion check	Self/record playback PAL signal IN • AUDIO IN 400 Hz, -10 dB	Distortion meter	—	—	—	AUDIO LINE OUT (100K Ω terminated)	—	Distortion factor: Less than 4%		
9	Wow and flutter check	Self-record/ playback • AUDIO IN 3 kHz, -10 dB	Wow and flutter meter	—	—	—	— do —	—	1) Wow and flutter: Less than 0.5 % (JIS, WTD) 2) Flutter: Less than 0.6 % (JIS)		

4-6. TIMER CHECK PROCEDURES

G Timer check

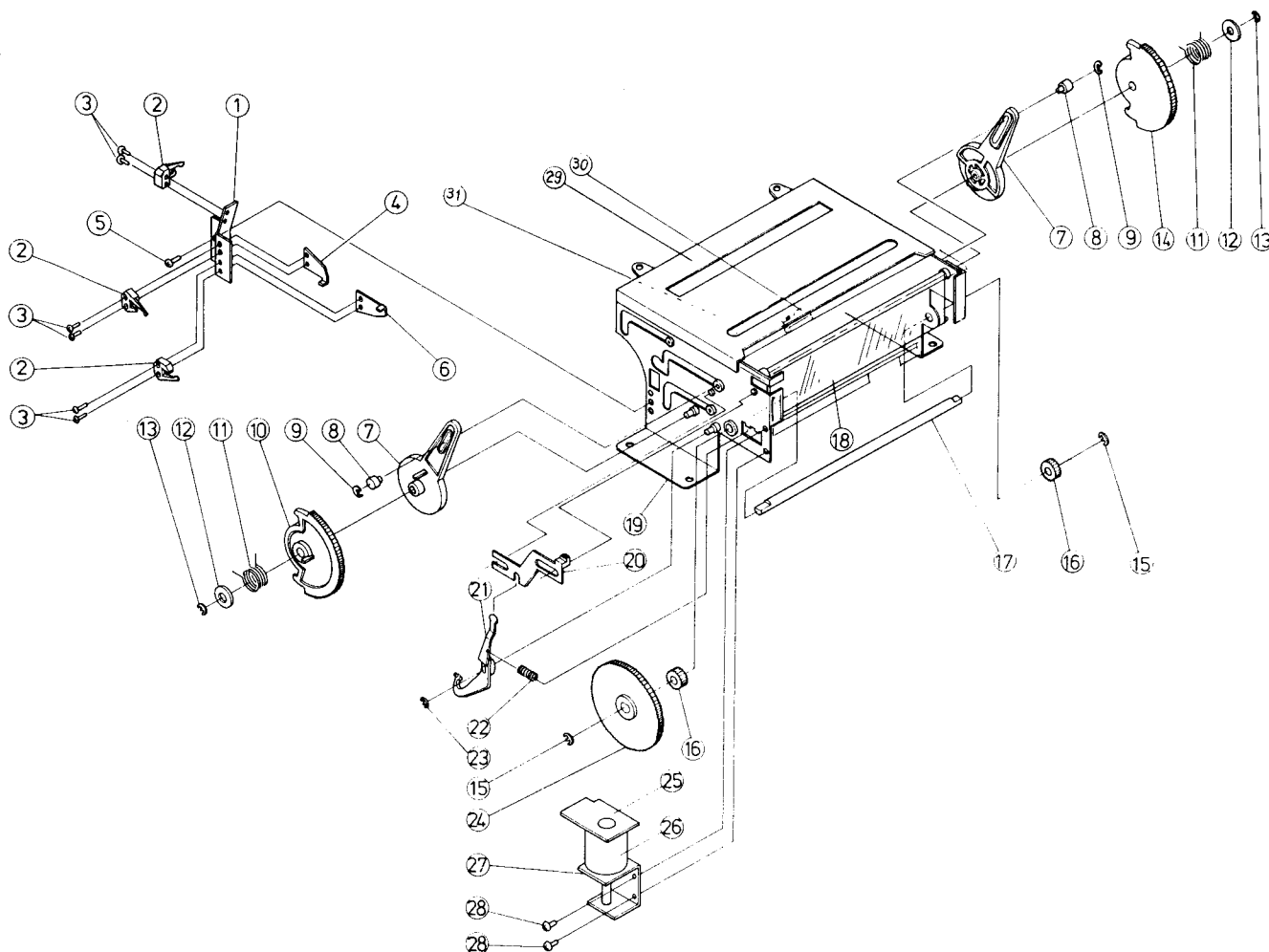
	Item	Check
1.	Timer operation verification	When the power switch is turned on, the timer display tube must flash at 0 : 00 and show "SUN" for weekday display. Timer display tube must stop flashing with the CLOCK SET button depressed.
2.	Current time setting	When the DAY, HOUR, and MIN buttons are depressed with the CLOCK SET button kept depressed, the time can be set accurately. DAY: When the DAY button is depressed once, it must advance one day. Display must advance from SUN to SAT and then return to SUN. HOUR: When the HOUR button is depressed once, it must advance one hour. Display must advance from 0 hour to 23 hours, returning to 0 : 00 hour. MIN: When the MIN button is depressed once, it must advance one minute. Display must advance from 00 minute to 59 minutes, returning to 00 minute.
3.	Setting of program start timing	When the DAY, HOUR, and MIN buttons are depressed with the start timing be set accurately. The operation of DAY, HOUR, and MIN button is the same as in item 2 above. The display shows the program start timing while the START TIME SET button is being depressed. When the START TIME SET button is released, the current time display is changed.
4.	Program length time setting	When the HOUR and MIN buttons are depressed with the REC LENGTH SET button kept depressed, setting must be arbitrarily made from 1 minute to 7 hours and 59 minutes in units of one minute. When the HOUR button is depressed once, it advances one hour. Thus, it advances from 0 hour to 7 hours, returning to 0 hour. The operation of MIN button is the same as in item 2. The display indicates the program time length while the REC LENGTH SET button is being depressed. When the button is released, the current time display is changed.
5.	Timer recording	Set the current time, record start and stop times. Then set the mode changeover switch to the TIMER mode. At that time, the timer mode LED should light. When the set time comes, the REC lamp lights, initiating recording. When the record time comes, the REC lamp goes out, to end recording.

MC-Service

SECTION 5

EXPLODED VIEW & MECHANICAL PARTS LIST

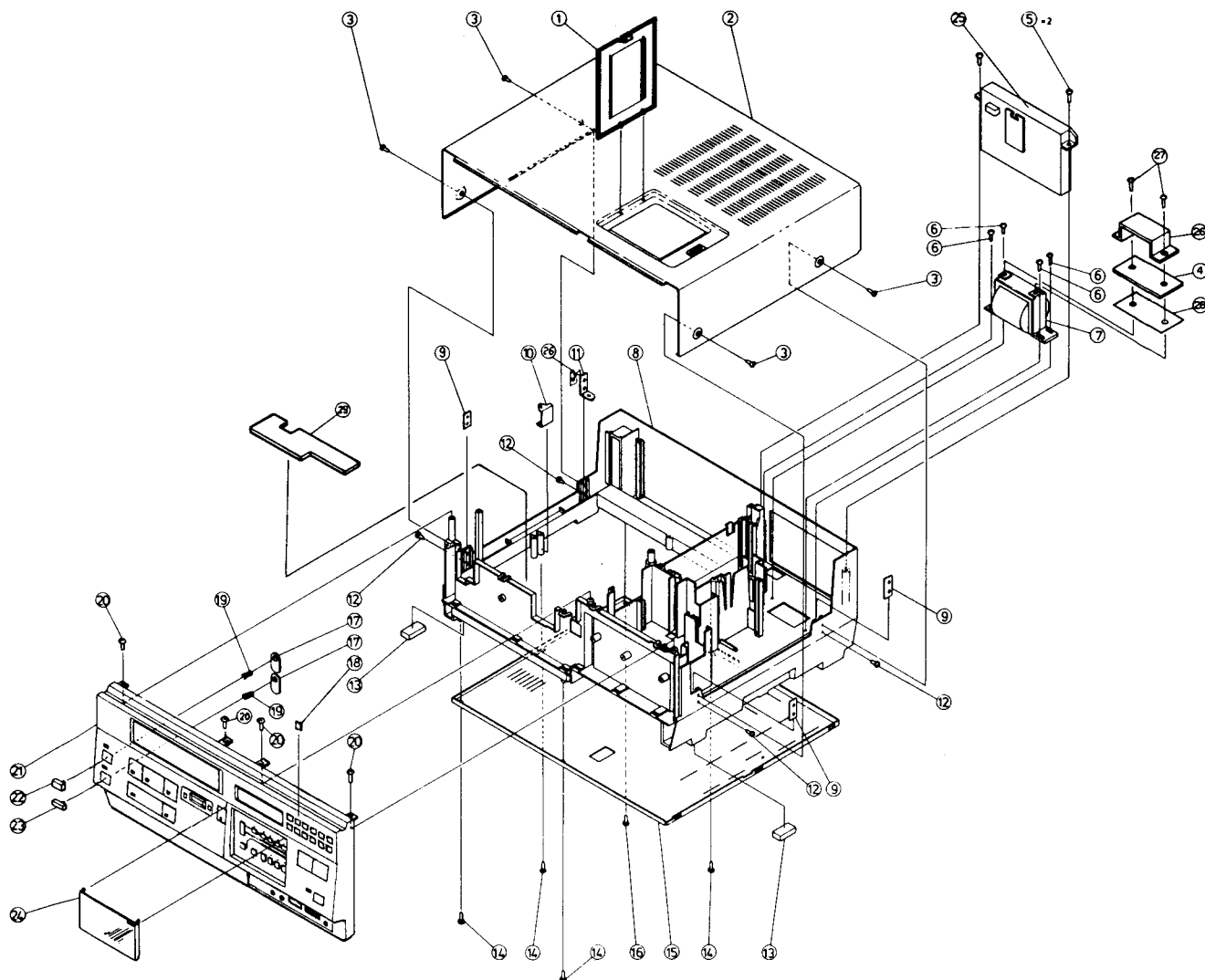
5-1. CASSETTE HOUSE ASSEMBLY



CASSETTE HOUSE ASSEMBLY

<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>	<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>
19	16174131	Front Loading Ass'y		16		Gear	
1		Holder, Switch		17		Shaft, Gear	
2		Switch		18		Front Cover	
3		CP1MSx 2x10x15BF		20		Slider	
4		Nut Plate		21	16431781	Lever	
5		Screw M3x5x15BF		22		Spring	
6		Nut Plate		23		E-Ring (3)	
7		Arm.		24		Warm-wheel	
8		Roller (3)		25		PWV-446	
9		E-Ring (2.5)		26	79502028	Motor	
10		Gear (L)		27		Motor S. Ass'y	
11		Spring, Clutch		28		Screw M2.6x4x15BF	
12		Screw PIWA 4x15BF		29		Caver Ass'y	
13		E-Ring (3)		30		Lamp	
14		Gear (R)		31		Insert SW	
15		E-Ring (4)					

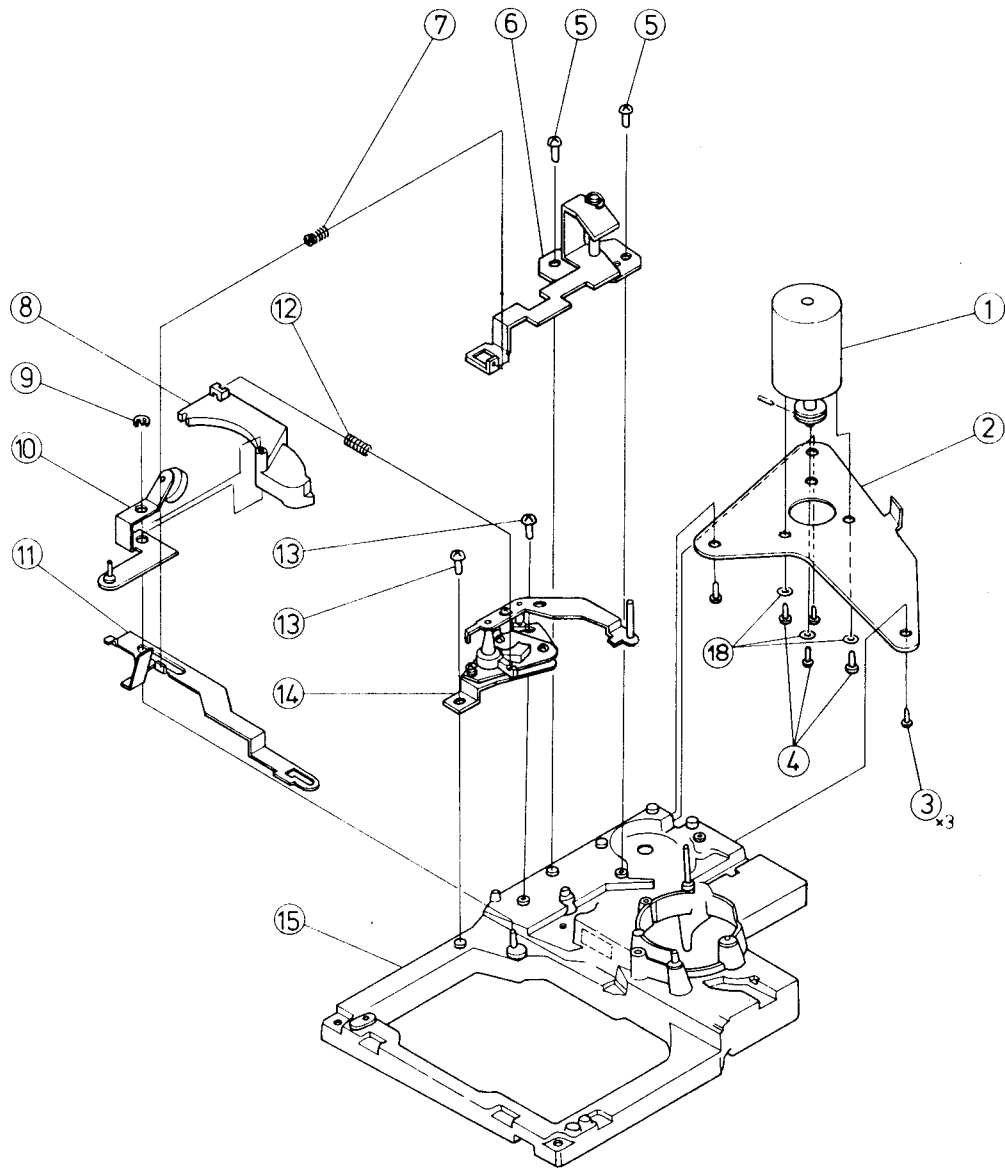
5-2. CABINET ASSEMBLY



CABINET ASSEMBLY

<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>	<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>
2	16173102	Top Case Ass'y		16		Screw M3x8x15BF	
1	16174601	Pre-Set Case Ass'y		21	16174591	Front Panel Ass'y	
3	91094015	CTIMs4x8x3AF		17		Holder, Spring	
5		Screw 2CPTS3x12x15BF		18		Channel Indicator	
6		Screw 2CPTS4x12x15BF		19		Spring, Power Knob	
7	45066203	Power Transformer		20		Screw 2CPTS4x12x15BF	
8		Bottom Chassis Ass'y		22		Knob, Power Reg	
9		Bracket, Top Cover		23		Knob, Timer Rec	
10		Shield Plate		24		Timer Lid.	
11		Bracket, Top case		25	71128509	Antenna Terminal Ass'y	
12		Screw		4	81205S01	Line Filter PWB Ass'y	
13		Foot		26	16627381	Shield Plate	
14		Screw 2CPTS3x12x15BF		27		Screw M3x8x15BF	
15	16570002	Bottom Board		28	16875551	Shield Plate	

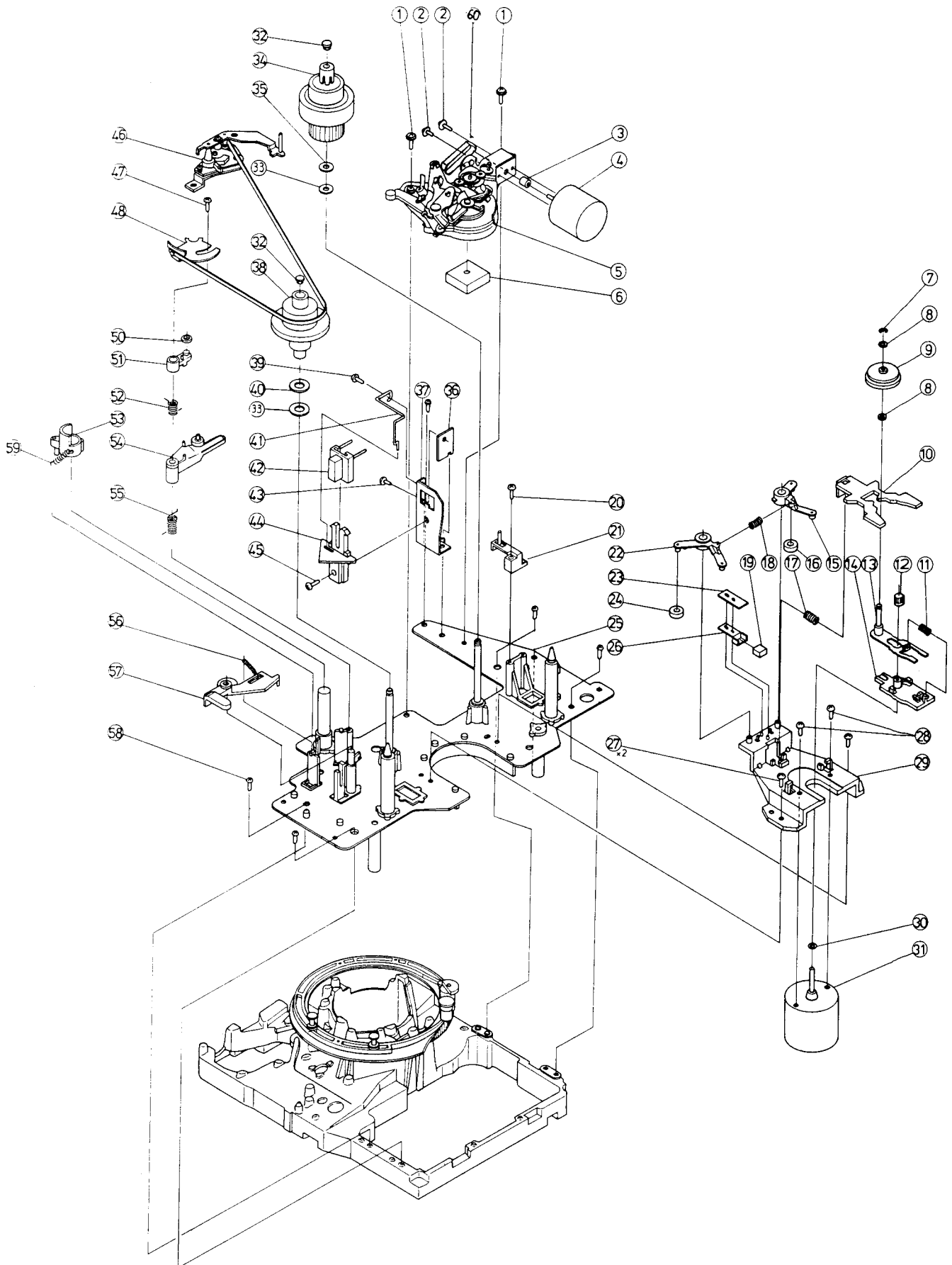
5-3. MECHA CHASSIS ASSEMBLY



MECHA CHASSIS ASSEMBLY

<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>	<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>
1	79502034	Motor, Capstan		10	16172623	Lever Ass'y (2), Tension Reg.	
2		Bracket, Capstan Motor		11	16570631	Lever, Drive	
3		Screw 3x8x15BF		12		Spring, BT	
4		Screw M2.6x4.15BF		13		Screw M3x8x15BF	
5		Screw M3x8x15BF		14	16172943	S-tension reg. Ass'y	
6	82203KA1	Pinch S. Ass'y		15		Mecha Chassis S. Ass'y	
7		Spring		16		Screw 2.6x5x35KF	
8		Lever, Tension Reg.		18		SIWAx2.6x15BF	
9		E-Ring					

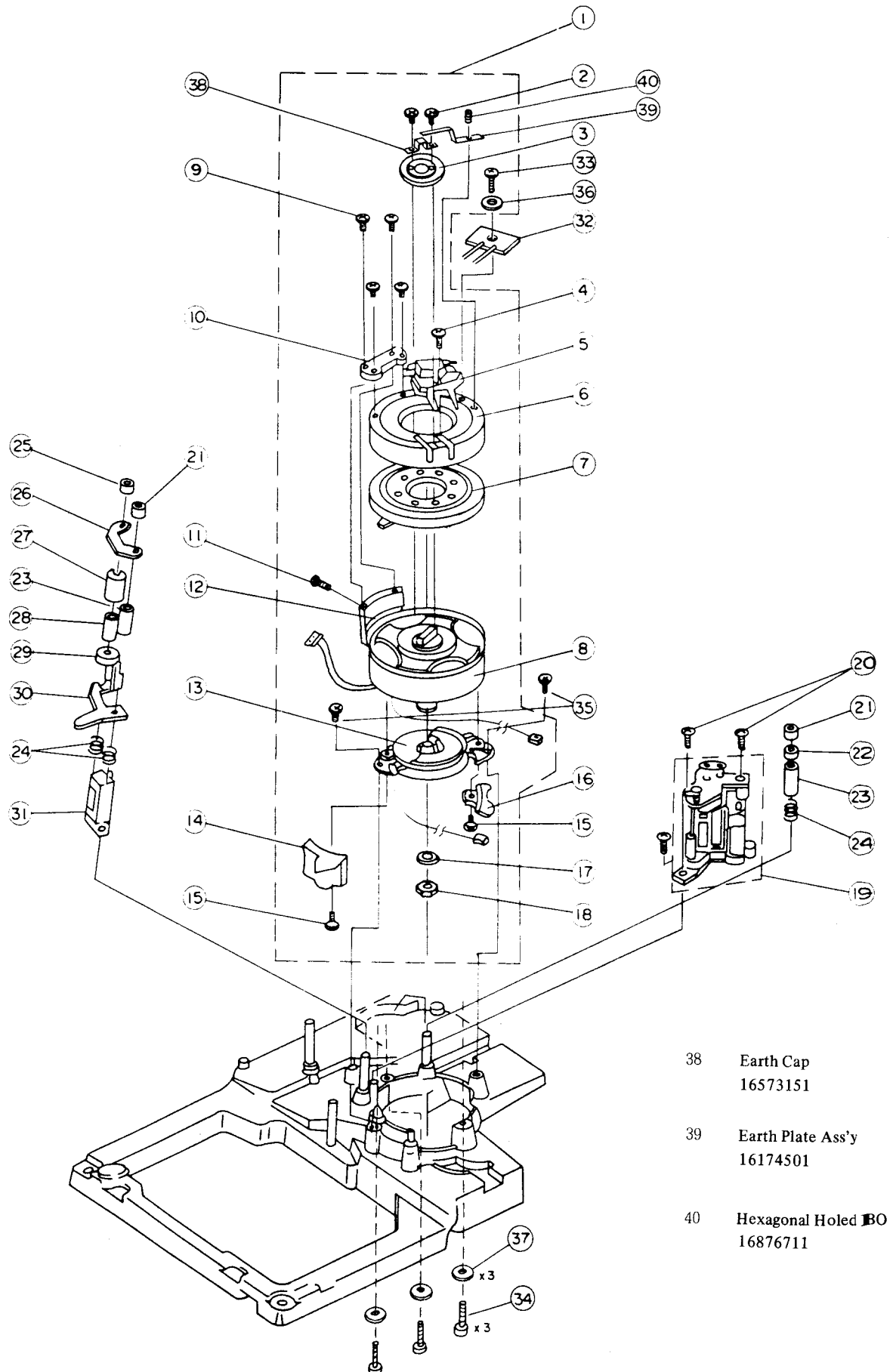
5-4. SUB CHASSIS ASSEMBLY



SUB CHASSIS ASSEMBLY

<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>	<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>
1		Screw STB 3x8		34	16172664	TU Reel Ass'y	
2		Screw M2.6x6x15BF		35	16626531	Spacer (Reel)	
3		Motor, Pulley		36		Noise Filter PWB Sub Ass'y	
4	79502029	Motor		37		Hold Plate, end Sensor	
5	16172857	Cam Box Ass'y		38	16172674	S-Reel Ass'y	
6		└ Switch, Rotary		39		Screw STB 3x8x15BF	
20		Screw 2.6x8		40	16626531	Spacer (Reel)	
21		Switch Leaf		41		Wire, end Sensor	
25		Chassis, Sub		42	79599381	End, Sensing	
29	16172841	Break Ass'y Main		43		Screw STB 3x8x15BF	
7		└ E Type Ring		44		Holder, end Sensor	
8		└ Plyslider (3)		45		Screw STB 3x8x15BF	
9		└ Ring Ass'y Idler		46	16172943	S-Tension Regulator	
10		└ Slide Plate		47		Screw 3x8x15BF	
11		└ Spring, Idler		48	16172711	Tension Regulator Band Ass'y	
12		└ Rulley, Motor		50		Brake Gum	
13		└ Slide Plate Ass'y, Idler		51		Brake Arm(s)	
14		└ Base, Idler		52		Brake Spring(s)	
15		└ Arm, Break		53	16432231	Tension Regulator Lever(s)	
16	16432311	└ Rubber, Break		54	16172641	Brake Release Arm Ass'y	
17		└ Spring, Slide		55		Spring, Brake Release	
18		└ Spring, Main Break		56		Spring, Soft Break	
19		└ Idler Shue		57	16432241	Break, Soft	
22		└ Arm, Break (L)		58		Screw 3x8x15BF	
23		└ Idler Release Plate		59		Spring, Tension Reg. Lever	
24	16432311	└ Rubber, Break		60	16432191	Belt, Roothing	
26		└ Idler, Release Plate					
27		└ Screw STB 3x8					
28		└ Screw M2.6x5x15BF					
30		└ Poly Slider					
31	79502030	└ Motor					
32	16432761	Cap, Shaft					
33	16876221	Spacer					

5-5. DRUM ASSEMBLY

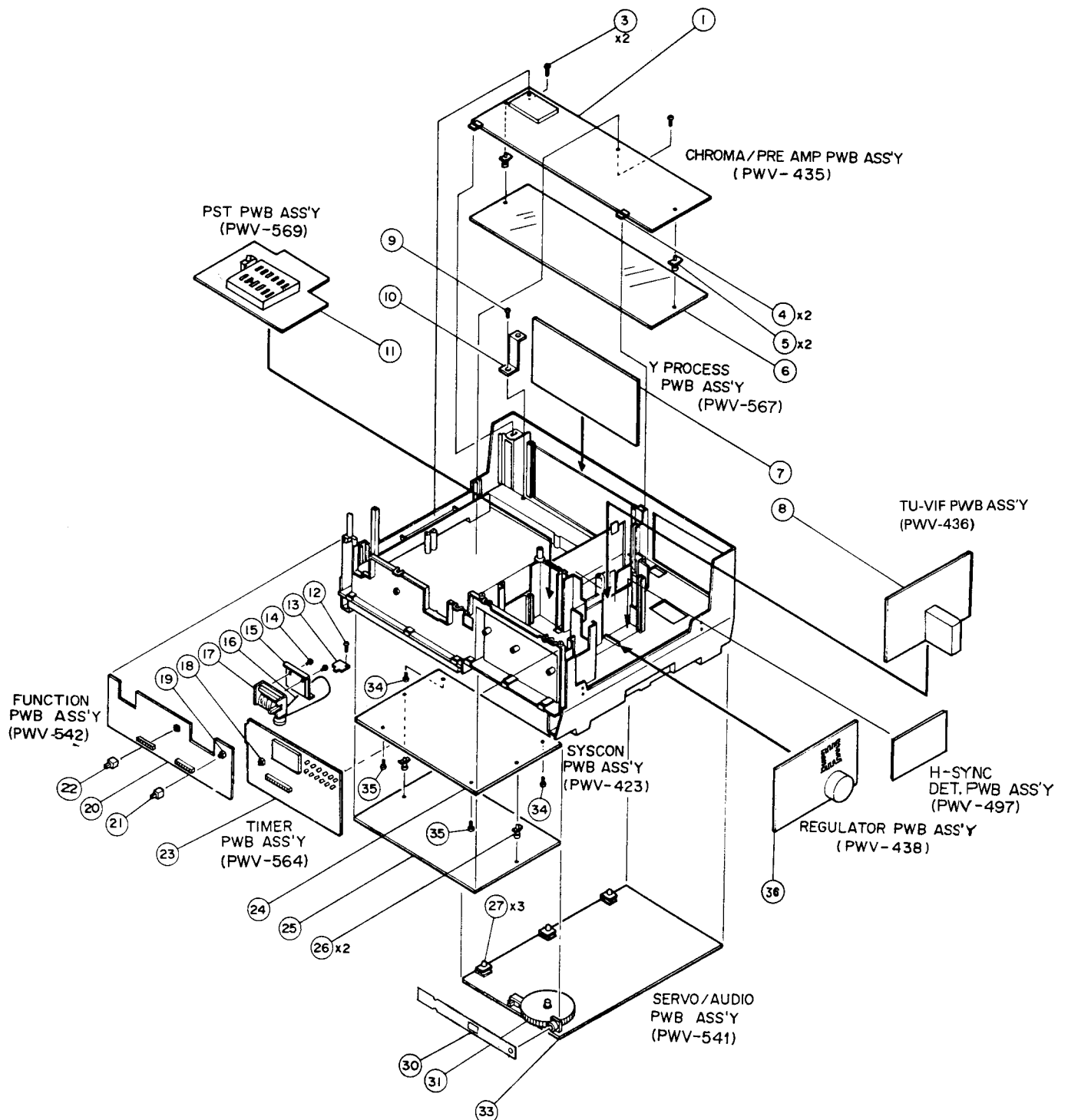


- 38 Earth Cap
16573151
- 39 Earth Plate Ass'y
16174501
- 40 Hexagonal Holed BO
16876711

DRUM ASSEMBLY

<i>No.</i>	<i>Part No.</i>	<i>Description</i>
1	082981AA1	Head Drum Ass'y
2		CP1MSx2x4x15KF
3		Disk Plate
4		CP1MSx3x5x15BF
5		Tape Holder Ass'y
6		Upper Drum
7	82981AH1	Rotary Drum Ass'y
8		Lower Drum Ass'y (3)
9		CP1MSx3x8x15BF
10		Upper Plate (N)
11		Hexagonal Holed Bolt M3x8x35K
12		Support
13	79502036	Drum Motor
14	16433011	Tape Holder (A)
15	16-876531	CP1MSx3x8x15BF
16	16433021	Tape Holder (B)
17	91510401	PIWAx4x15BF
18	91460401	EHEX1Nx4x15BF
19	82212PA1	ACE Ass'y
20	16870811	Screw STB 3x8x15BF
21	16529822	Nut (2)
22	16529871	Guide Flange
23	16529851	Guide Sleeve
24	16567142	Coil Spring
25	16529812	Nut (1)
26	16569761	Guide Plate (N)
27	16170721	No.1, Guide Roller Ass'y
28	16529881	Guide Sleeve (1)
29	91510302	PIWAx3x15CF
30	16569771	Tape Support (N)
31	79501021	Erase Head
32	79599468	Dew Sensor
33	91013021	CP1MSx3x5x15BF
34	16876621	Hexagonal detach Bolt
35	16876561	Screw M4x8x15BF
36	16876481	Nylon Washer
37	91490261	Washer

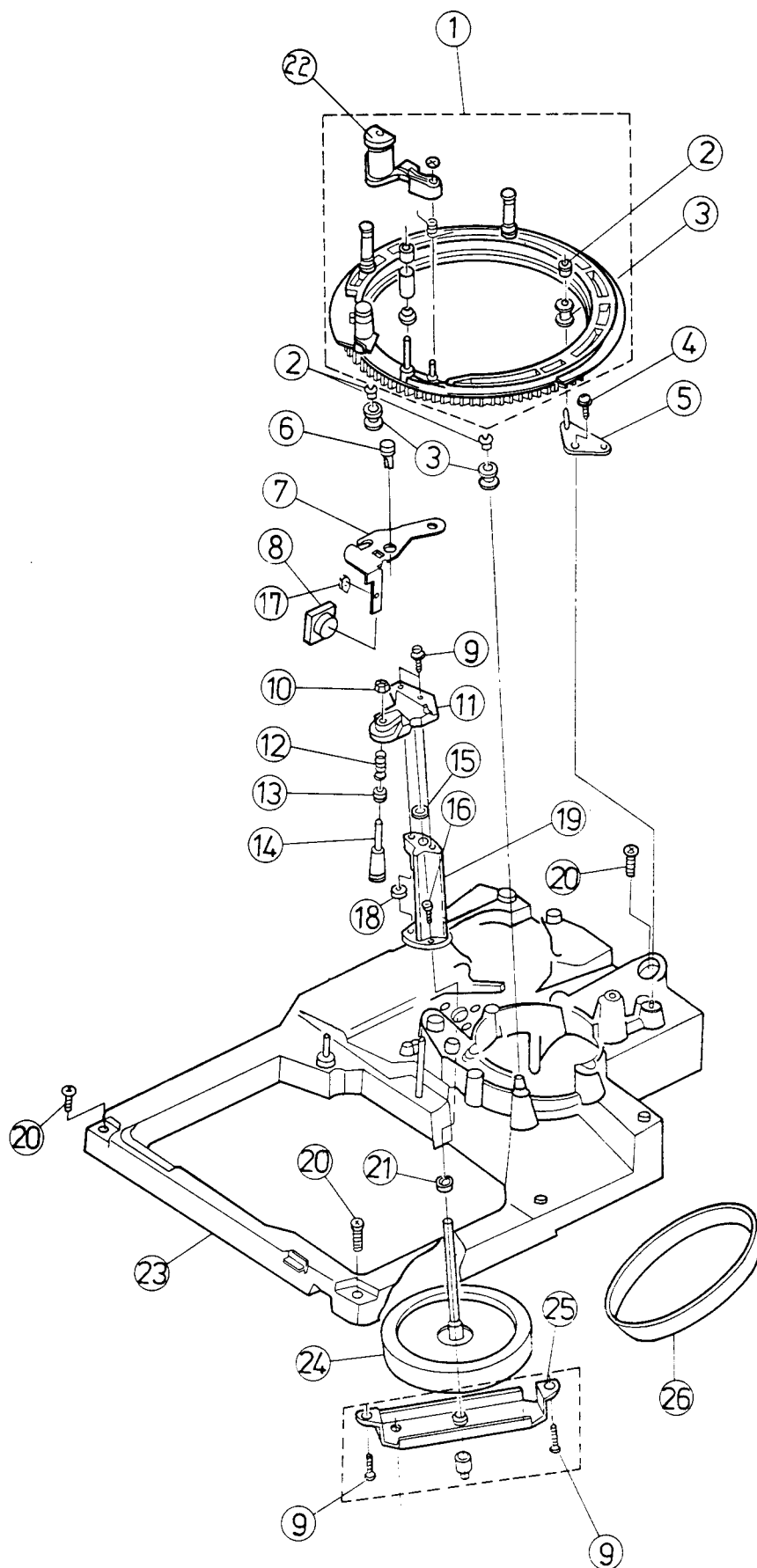
5-6. PWB ASS'Y



PWB ASS'Y

<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>	<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>
1	81241L01	CHROMA/PRE-AMP PWB Ass'y		18	65180020	Switch, Slide	
3		Screw STB 3x8x15BF		19	65330041	Switch, Push	
4		Hinge		20	81240K01	Function PWB Ass'y	
5	16286291	Spacer, Support		21	16434831	Button, Memory	
6	16626983	Video Shield Plate		22	16434414	Timer SW Knob	
7	81240B01	Y-PROCESS PWB Ass'y		23	81240F01	Timer PWB Ass'y	
8	81207E01	TU-VIF PWB Ass'y		24	81239D01	Syscon PWB Ass'y	
9		Screw 3x12x15BF		25	16627131	Insulating Plate, Syscon	
10	16571303	PWB, Bracket		26	16286291	Spacer, Support	
11	81240Q01	PST PWB Ass'y		27	16286431	Hinge	
12		Screw M3x6.15BF		30	16627311	Shield Cloth	
13	81212TV1	TU Sens PWB V. Ass'y		31	16430091	Knob, Tracking	
14		Screw 2.6x6x15BF		33	81240C01	Servo/Audio PWB Ass'y	
15	16572362	Bracket, Counter		34		Screw STB 3x8x15BF	
16	16432421	Belt Counter		35		Screw 2x12x15BF	
17	16286452	Counter		36	81239A01	Regulator PWB Ass'y	

5-7. MECHA CHASSIS ASSEMBLY



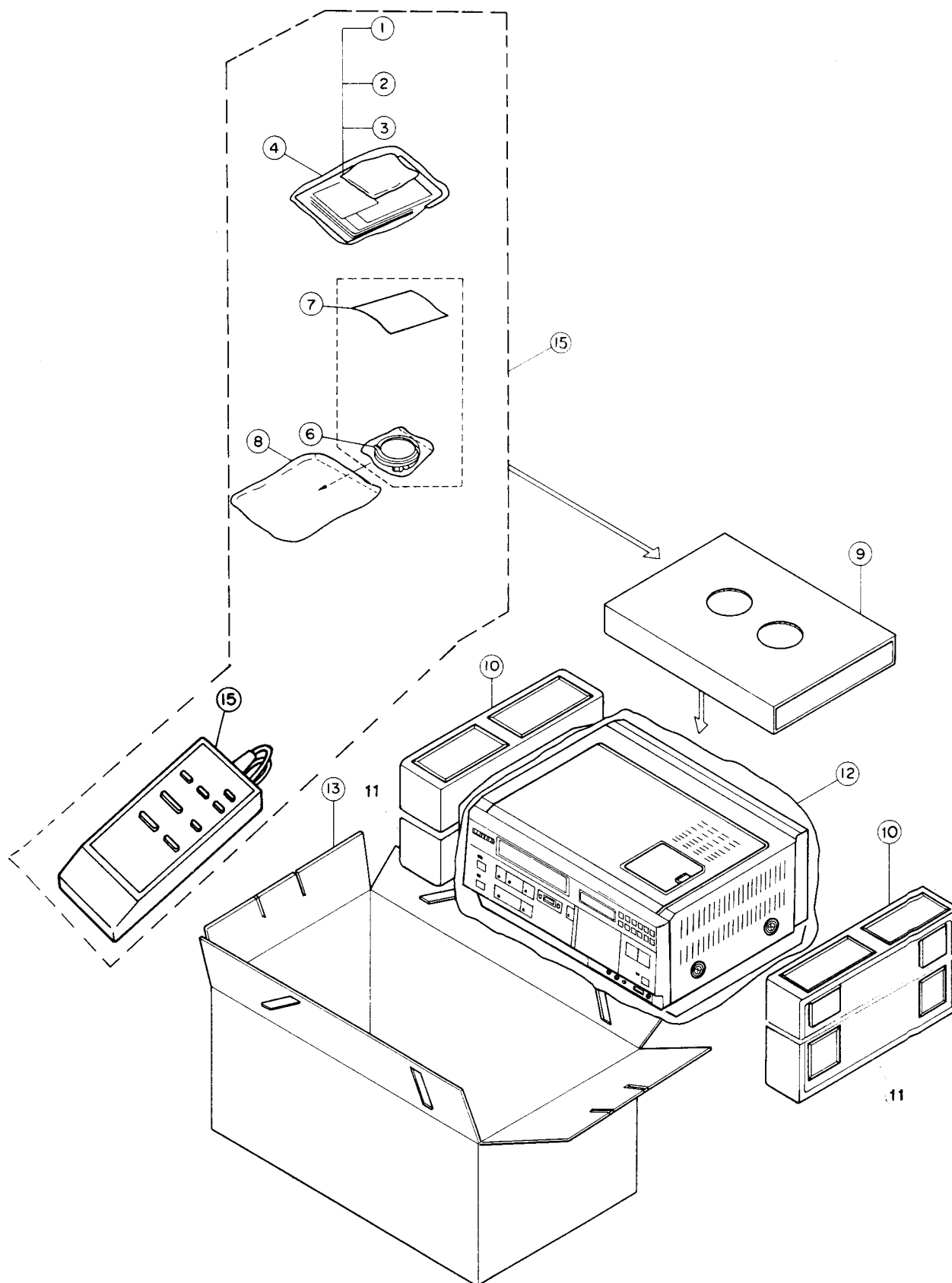
MECHA CHASSIS ASSEMBLY

<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>
1	16172691	Loading Ring Ass'y	
2	16429601	Cap (ϕ 3)	
3		Roller, Ring	
4		Screw M3x8x15BF	
5	16170581	Ring Roller Plate	
6	16285851	Rivet, Push	
7	16571361	Bracket, Sensing Head	
8	79599448	Sensing Head	
9		Screw M3x8x15BF	
10		Screw HEXIN 3x15CF	
11	16429611	Zero Position Guide Frame	
12	16567981	Coil, Spring	
13	16530141	Zero Position Guide Uper Flange	

MECHA CHASSIS ASSEMBLY

<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>
14	16171061	Zero Position Guide Ass'y	
15	16429581	Capstan Oil Stopper	
16		Screw M3x8x15BF	
17	91430202	Nut (M2)	
18	16429961	Oil Cap	
19	82183HB1	Capstan Housing Ass'y	
20		Screw CPIMS 4x25x15CF	
21	16626491	Washer (ϕ 3.4)	
22	16171641	Pinch Roller Ass'y	
23	82181HA1	Mecha Chassis Ass'y	
24	16174711	Capstan Block Ass'y	
25	16170882	Capstan Hdd Ass'y	
26	16430212	Belt, Capstan	

5-8. PACKING ASSEMBLY



PACKING ASSEMBLY

<u>No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>
4		Accessory Sabass'y (2)	
1	16733331	Number Plate	
2		Bag. Poly 260 x 380	
3	78812371	Instruction Booklet	
8		Accessory Sabass'y (1)	
7		Bag. Poly 230 x 310	
6	70799041	IEC Plug Cable	
15		Accessory Sabass'y (3)	
9	16828121	Accessory Spacer	
4		Accessory Sabass'y (2)	
8		Accessory Sabass'y (1)	
16	65913528	Commander Assembly	
10		Cushion (TOP)	
11		Cushion (BTM)	
12		Package Poly Bag.	
13		Individual Carton	
15	16829281	Remocon Unit RB76E	

MC-Service

SECTION 6

ELECTRICAL PARTS LIST

<i>Reference No.</i>	<i>Part No.</i>	<i>Description</i>	<i>Remarks</i>
REGULATOR	PWB	ASS'Y (81239A01)	
TR003, 004, 006, 007, 008, 009, 010	35541931	TR, 2SC2785 (E, F, H, J)	
D009	36003049	Diode, Zener MPC-574J	
D004, D005	36003072	Diode RD-6.2EB	
D006	36003903	Zener Diode 5.6V	
D002, 003	36001527	Diode 1SS53	
D001	36107288	Diode D5FB10	
D007, 008, 010, 011	36902080	Diode 10E2 (Forming)	
R022		R, Carbon 22K Ω 5% 1/4W	
R003, 012, 013, 018		R, Carbon 1.0K Ω 5% 1/4W	
R014		R, Carbon 1.5K Ω 5% 1/4W	
R004, 019		R, Carbon 2.0K Ω 5% 1/4W	
R002, 011, 015		R, Carbon 2.2K Ω 5% 1/4W	
R001, 005, 010, 020, 021		R, Carbon 2.7K Ω 5% 1/4W	
R009, 016		R, Carbon 10K Ω 5% 1/4W	
R007		R, Carbon 22K Ω 5% 1/4W	
R006, 008		R, Carbon 47K Ω 5% 1/4W	
VR001	41085054	R, Variable 500 Ω 0.1W	
VR002, 003	41085055	R, Variable 1K Ω 0.1W	
C014, 015		C, Ceramic 500V 0.01 μ F	
C001, 002, 003, 004		C, Ceramic 50V 0.01 μ F	
C005		C, Elec. 25V 10000 μ F	
C006		C, Elec. 25V 47 μ F	
C012		C, Elec. 35V 470 μ F	
C011		C, Elec. 100V 47 μ F	
C017		C, Elec. 10V 100 μ F	
C007, 008, 009, 010		C, Elec. 25V 47 μ F	
C013		C, Elec. 50V 1.0 μ F	
C016		C, Elec. 50V 10 μ F	
	66671016	Fuse 4A 250V Semko 20MM	

Reference No.	Part No.	Description	Remarks
Y-PROCESS PWB ASS'Y (81240B01)			
TR004	35501131	TR, 2SA1175 (E, F, H, J)	
TR022	35520111	TR, 2SB733 (K)	
TR003, 008, 011, 013	35541931	TR, 2SC2785 (E, F, H, J)	
TR001, 005, 012, 014, 015, 017, 019, 023	35541931	TR, 2SC2785 (E, F, H, J)	
TR006, 007, 016	35501131	2SA1175 (E, F, H, J)	
D003, 004, 005, 009	36003955	Silicon Diode, RV35V	
IC001	37101100	IC LA7020	
IC002	37101101	IC LA7025	
R001, 034, 038		R, Carbon 100Ω 5% 1/6W	
R028, 035		R, Carbon 150Ω 5% 1/6W	
R013		R, Carbon 200Ω 5% 1/6W	
R060		R, Carbon 220Ω 5% 1/6W	
R042		R, Carbon 270Ω 5% 1/6W	
R049, 050		R, Carbon 560Ω 5% 1/6W	
R048		R, Carbon 620Ω 5% 1/6W	
R018, 040		R, Carbon 820Ω 5% 1/6W	
R004, 005, 006, 008, 010, 012, 017, 021, 045, 047, 061, 062, 070		R, Carbon 1.0KΩ 5% 1/6W	
R024		R, Carbon 1.5KΩ 5% 1/6W	
R030, 044		R, Carbon 1.6KΩ 5% 1/6W	
R043, 063, 122		R, Carbon 1.8KΩ 5% 1/6W	
R011		R, Carbon 2.0KΩ 5% 1/6W	
R036, 037, 039, 090, 105		R, Carbon 2.2KΩ 5% 1/6W	
R051		R, Carbon 2.7KΩ 5% 1/6W	
R023, 055, 118		R, Carbon 3.3KΩ 5% 1/6W	
R020		R, Carbon 4.7KΩ 5% 1/6W	
R054		R, Carbon 5.1KΩ 5% 1/6W	
R057		R, Carbon 5.6KΩ 5% 1/6W	
R022		R, Carbon 6.8KΩ 5% 1/6W	
R029		R, Carbon 9.1KΩ 5% 1/6W	
R002, 003, 007, 016, 046, 081, 091, 116, 117, 120		R, Carbon 10KΩ 5% 1/6W	
R092		R, Carbon 12KΩ 5% 1/6W	
R082, 086		R, Carbon 22KΩ 5% 1/6W	
R073, 079, 080, 121		R, Carbon 33KΩ 5% 1/6W	
R083, 088		R, Carbon 47KΩ 5% 1/6W	
R009		R, Carbon 56KΩ 5% 1/6W	
R084, 115		R, Carbon 100KΩ 5% 1/6W	
R019		R, Carbon 120KΩ 5% 1/6W	
R026, 085		R, Carbon 150KΩ 5% 1/6W	
R015, 071		R, Carbon 1.0MΩ 5% 1/6W	
R058		R, Carbon 100Ω 5% 1/4W	
R025		R, Carbon 47Ω 5% 1/4W	
R027		R, Carbon 130Ω 5% 1/4W	
R075, 076		R, Carbon 270Ω 5% 1/4W	
R041		R, Carbon 240Ω 5% 1/4W	
R056		R, Carbon 300Ω 5% 1/4W	
R077		R, Carbon 750Ω 5% 1/4W	
R053		R, Carbon 1.0KΩ 5% 1/4W	
R052		R, Carbon 6.2KΩ 5% 1/4W	
R059		R, Carbon 200KΩ 5% 1/4W	
R087		R, Carbon 510KΩ 5% 1/4W	
R089		R, Carbon 4.7MΩ 5% 1/4W	
R078		R, Carbon 68Ω 5% 1/4W	
MC-Service			

<i>Reference No.</i>	<i>Part No.</i>	<i>Description</i>	<i>Remarks</i>
R074		R, Carbon 1.0K Ω 5% 1/4W	
R072		R, Carbon 33K Ω 5% 1/4W	
VR003	41085054	R, Variable 500 Ω 0.1W	
VR002, 004, 008, 011	41085055	R, Variable 1K Ω 0.1W	
VR006, 007	41085056	R, Variable 2K Ω 0.1W	
VR001	41085058	R, Variable 5K Ω 0.1W	
VR009	41085059	R, Variable 10K Ω 0.1W	
VR005	41085061	R, Variable 30K Ω 0.1W	
C009, 017, 022, 036, 041, 063		C, Ceramic 50V 0.047 μ F	
C038		C, Ceramic 50V 510pF	
C008		C, Ceramic 50V 680pF	
C046		C, Ceramic 25V 0.047 μ F	
C006, 047		C, Ceramic 25V 0.1 μ F	
C019, 020, 034, 039		C, Ceramic 50V 0.01 μ F	
C044		C, Ceramic 50V 560pF	
C018		C, Ceramic 50V 680pF	
C015		C, Ceramic 50V 820pF	
C035		C, Ceramic 50V 56pF	
C025		C, Ceramic 50V 390pF	
C016, 030		C, Ceramic 50V 51pF	
C027		C, Ceramic 50V 47pF	
C031		C, Ceramic 50V 27pF	
C065		C, Ceramic 50V 39pF	
C028		C, Ceramic 50V 120pF	
C011, 024		C, Ceramic 50V 180pF	
C026		C, Ceramic 50V 300pF	
C037		C, Film 50V 0.1 μ F	
C045		C, Film 50V 5% 3300pF	
C021		C, Elec. 10V 47 μ F	
C042		C, Elec. 10V 1000 μ F	
C004		C, Elec 25V 22 μ F	
C032		C, Elec. 50V 4.7 μ F	
C007, 010, 040, 055		C, Elec. 10V 47 μ F	
C001, 029, 033, 043		C, Elec. 10V 100 μ F	
C005		C, Elec. 16V 33 μ F	
C053		C, Elec. 25V 47 μ F	
C067		C, Elec. 50V 10 μ F	
L003, 006	61072023	Coil Filter 18 μ H \pm 10%	
L007	61072024	Coil Filter 22 μ H \pm 10%	
L010	61072026	Coil Filter 33 μ H \pm 10%	
L004, 008	61072031	Coil Filter 82 μ H \pm 10%	
L002, 005	61072034	Coil Filter 150 μ H \pm 10%	
T001	61815091	5.5MHz Trap	
FL002	79552026	Filter, LPF	
FL001	79552030	Filter, LPF 3.0MHz (REC)	
FL003	79552035	Filter, Deley Line 600NSEC	

Reference No.	Part No.	Description	Remarks
SERVO/AUDIO PWB ASS'Y (81240C01)			
TR011, 018	35065416	TR, 2SD882 P	
TR006, 010, 019, 026, 202, 210, 38	35501131	TR, 2SA1175 (E, F, H, J)	
TR003, 007, 008, 009, 015, 016, 017, 035, 036, 204, 205, 208, 209, 211, 37	35541931	TR, 2SC2785 (E, F, H, J)	
TR201, 203	35561200	TR, 2SD637	
ZD001	36003904	Zener Diode 6.2V	
D021	36003955	Silicon Diode RV35V	
D012	36003955	Silicon Diode RV35V	
D014	36001527	Diode 1SS53	
D008, 009, 016, 017, 018, 019, 201, 202, 203, 205, 206, 207	36003955	Silicon Diode, RV35V	
IC101	37101123	IC μ PC1504C	
IC102	37101124	IC μ PC1505C	
IC201	37101125	IC LA-7040	
R081		R, Carbon 2.2 Ω 5% 1/4W	
R087		R, Carbon 75 Ω 5% 1/6W	
R212		R, Carbon 180 Ω 5% 1/6W	
R219		R, Carbon 330 Ω 5% 1/6W	
R063		R, Carbon 510 Ω 5% 1/6W	
R218		R, Carbon 560 Ω 5% 1/6W	
R073, 078, 086		R, Carbon 1.0K Ω 5% 1/6W	
R085		R, Carbon 1.5K Ω 5% 1/6W	
R061, 227		R, Carbon 1.8K Ω 5% 1/6W	
R016		R, Carbon 2.0K Ω 5% 1/6W	
R215, 223, 228		R, Carbon 2.2K Ω 5% 1/6W	
R030, 126, 129		R, Carbon 3.3K Ω 5% 1/6W	
R088, 204, 226		R, Carbon 5.6K Ω 5% 1/6W	
R214		R, Carbon 8.2K Ω 5% 1/6W	
R005, 025, 233, 240		R, Carbon 10K Ω 5% 1/6W	
R006, 072, 216		R, Carbon 15K Ω 5% 1/6W	
R059		R, Carbon 16K Ω 5% 1/6W	
R038, 140, 203		R, Carbon 18K Ω 5% 1/6W	
R009, 076, 080, 207, 208, 225, 231, 232		R, Carbon 22K Ω 5% 1/6W	
R036, 039, 040, 124, 125, 127, 128, 138		R, Carbon 33K Ω 5% 1/6W	
R201, 211, 234		R, Carbon 47K Ω 5% 1/6W	
R069, 192		R, Carbon 68K Ω 5% 1/6W	
R051		R, Carbon 82K Ω 5% 1/6W	
R026, 079, 130, 132, 137, 209		R, Carbon 100K Ω 5% 1/6W	
R007		R, Carbon 110K Ω 5% 1/6W	
R092, 213		R, Carbon 120K Ω 5% 1/6W	
R205		R, Carbon 220K Ω 5% 1/6W	
R139		R, Carbon 680K Ω 5% 1/6W	
R031, 142, 206, 224		R, Carbon 1.0M Ω 5% 1/6W	
R083, 136	40399006	R, Metal 47 Ω 5% 1W	
R011	40402728	R, Metal 200K Ω 1% 1/4W	
R230		R, Carbon 4.7 Ω 1/4W	
R202		R, Carbon 220 Ω 5% 1/4W	
R016		R, Carbon 910 Ω 5% 1/4W	
R164		R, Carbon 1.0K Ω 5% 1/4W	
R012		R, Carbon 2.4K Ω 5% 1/4W	
R118		R, Carbon 6.8K Ω 5% 1/4W	
R147, 155		R, Carbon 10K Ω 5% 1/4W	
R124		R, Carbon 33K Ω 5% 1/4W	
R021		R, Carbon 1.8M Ω 1/4W	
R141		R, Carbon 9.1K Ω 5% 1/4W	

Reference No.	Part No.	Description	Remarks
R033		R, Carbon 180Ω 5% 1/4W	
R241		R, Carbon 330Ω 5% 1/4W	
R034, 074, 093		R, Carbon 1.0KΩ 5% 1/4W	
R017, 245		R, Carbon 1.5KΩ 5% 1/4W	
R084		R, Carbon 2.0KΩ 5% 1/4W	
R193, 244, 246		R, Carbon 2.2KΩ 5% 1/4W	
R013		R, Carbon 2.4KΩ 5% 1/4W	
R062		R, Carbon 6.8KΩ 5% 1/4W	
R024, 135		R, Carbon 7.5KΩ 5% 1/4W	
R097, 221		R, Carbon 10KΩ 5% 1/4W	
R028		R, Carbon 15KΩ 5% 1/4W	
R134		R, Carbon 18KΩ 5% 1/4W	
R014, 060, 131, 198, 249		R, Carbon 22KΩ 5% 1/4W	
R042, 064, 123		R, Carbon 33KΩ 5% 1/4W	
R210, 235		R, Carbon 47KΩ 5% 1/4W	
R222		R, Carbon 100KΩ 5% 1/4W	
R032		R, Carbon 220KΩ 5% 1/4W	
R143		R, Carbon 330KΩ 5% 1/4W	
R037		R, Carbon 1.5MΩ 5% 1/4W	
VR011	41085053	R, Variable 300Ω 0.1W	
VR203	41085059	R, Variable 10KΩ 0.1W	
VR202, 204	41085060	R, Variable 20KΩ 0.1W	
VR005, 006	41085062	R, Variable 50KΩ 0.1W	
VR003, 008	41085063	R, Variable 100KΩ 0.1W	
VR001, 002	41085064	R, Variable 200KΩ 0.1W	
VR201	41085066	R, Variable 500KΩ 0.1W	
VR007	41099072	R, Variable 100KΩ	
C202		C, Ceramic 500V 560pF	
C004		C, Ceramic 50V 4700pF	
C036, 232		C, Ceramic 50V 0.01μF	
C220		C, Ceramic 50V 330pF	
C026, 054, 055, 060		C, Ceramic 50V 1000pF	
C016, 020, 056, 057		C, Ceramic 50V 0.01μF	
C019		C, Ceramic 50V 0.022μF	
C201		C, Ceramic 50V 220pF	
C209		C, Ceramic 50V 1000pF	
C208		C, Ceramic 50V 240pF	
C047		C, Ceramic 50V 100pF	
C225		C, Ceramic 50V 300pF	
C216		C, Film 50V 1500pF	
C223		C, Film 50V 4700pF	
C226		C, Film 50V 8200pF	
C008		C, Film 50V 0.01μF	
C219		C, Film 50V 0.012μF	
C005, 006		C, Film 50V 0.015μF	
C207		C, Film 50V 0.018μF	
C009, C203		C, Film 50V 0.022μF	
C010		C, Film 50V 0.039μF	
C044		C, Film 50V 0.047μF	
C041, 046		C, Film 50V 0.068μF	
C015, 040		C, Film 50V 0.1μF	
C039		C, Film 50V 0.33μF	
C014		C, Film 50V 0.27μF	
C204		C, Film 50V 5% 0.047μF	
C043		C, Elec. 50V 0.22μF	
C233		C, Elec. 10V 100μF	

Reference No.	Part No.	Description	Remarks
C033, 214		C, Elec. 16V 10μF	
C024		C, Elec. 16V 22μF	
C212, 222		C, Elec. 16V 100μF	
C234		C, Elec. 50V 0.47μF	
C031		C, Elec. 50V 0.22μF	
C224		C, Elec. 10V 47μF	
C050		C, Elec. 10V 100μF	
C205		C, Elec. 16V 10μF	
C013, 049, 228		C, Elec. 16V 33μF	
C018		C, Elec. 25V 22μF	
C007, 012, 213, 229		C, Elec. 25V 47μF	
C034		C, Elec. 25V 100μF	
C058, 221		C, Elec. 50V 0.47μF	
C038, 206		C, Elec. 50V 1.0μF	
C218		C, Elec. 50V 2.2μF	
C021, 022, 037, 045, 231		C, Elec. 50V 3.3μF	
C210		C, Elec. 50V 4.7μF	
C003, 027, 032, 042, 176, 211, 217		C, Elec. 50V 10μF	
L203	61052041	Coil, Filter S102K	
L201	61055008	Coil, Filter L-8 223J	
L202	61064061	Coil, Filter S153J	
T201	61811012	OSC Trans 65KHz	
SW101	65330030	SW, Slide	
JC004	70905358	Remoto Jack DIA2.5	

SYSCON PWB ASS'Y (81239D01)

TR010, 011, 025, 026	35065416	TR, 2SD882 P	
TR001, 021, 028, 031	35501131	TR, 2SA1175 (E, F, H, J)	
TR007, 008, 022, 023	35501216	TR, 2SB772 (P)	
TR002, 003, 004, 005, 009, 012, 013, 014, 015, 017, 018, 019, 020, 024, 027, 029, 030, 032, 033, 034, 036, 037, 038, 039, 040	35541931	TR, 2SC2785 (E, F, H, J)	
TR006	35560800	TR, 2SD985	
D028, 029, 030	36003955	Silicon Diode, RV35V	
D021	36001527	Diode 1SS53	
D001, 003, 004, 005, 008, 009, 010, 019, 020, 022, 023, 024	36003955	Silicon Diode, RV35V	
D002, 011, 012, 013, 014, 015, 016, 017, 018	36902080	Diode 10E2 (Forming)	
IC001	37151106	MOS μPD 546C-330	
IC003, 004, 005	37151108	MOS μPD4503BC	
OSC001	39080008	Ceramic Resonator 400KHz	
RM008	39906017	R, Block 100KΩ M*10 1/8W	
RM002, 003, 004, 005, 009	39906018	R-Block 100KΩ M*4 1/8W	
RM006	39906025	R-Block 100KΩ M*8	
RM007, 010	39906031	R-Block 100KΩ M*5	
RM001	39906032	R-Block 100KΩ M*9	
R163		R, Carbon 16Ω 5% 1/4W	
R090		R, Carbon 56Ω 5% 1/6W	
R101		R, Carbon 470Ω 5% 1/6W	
R019, 029, 039, 040, 160		R, Carbon 1.0KΩ 5% 1/6W	

Reference No.	Part No.	Description	Remarks
R023, 063, 102		R, Carbon 2.2K Ω 5% 1/6W	
R084		R, Carbon 3.3K Ω 5% 1/6W	
R009, 034, 035, 077, 078		R, Carbon 4.7K Ω 5% 1/6W	
R082, 091		R, Carbon 6.8K Ω 5% 1/6W	
R030, 031, 053, 056, 059, 073, 074		R, Carbon 10K Ω 5% 1/6W	
R008, R083		R, Carbon 15K Ω 5% 1/6W	
R093		R, Carbon 18K Ω 5% 1/6W	
R094		R, Carbon 20K Ω 5% 1/6W	
R005, 007, 018, 027, 062, 064, 085, 086, 089, 095, 098, 104, 115, 119, 121, 123, 125, 127, 131, 133, 143		R, Carbon 22K Ω 5% 1/6W	
R087, 096		R, Carbon 33K Ω 5% 1/6W	
R042, 043		R, Carbon 47K Ω 5% 1/6W	
R011, 021, 048, 072, 088, 097, 105		R, Carbon 100K Ω 5% 1/6W	
R162		R, Carbon 330K Ω 5% 1/6W	
R001		R, Carbon 1.0M Ω 5% 1/6W	
R003		R, Fuse 1.0 Ω 5% 1/2W	
R002		R, Fuse 3.3 Ω 5% 1/2W	
R166		R, Carbon 1.0K Ω 5% 1/4W	
R041		R, Carbon 10K Ω 5% 1/4W	
R099		R, Carbon 56 Ω 5% 1/4W	
R020		R, Carbon 120 Ω 5% 1/4W	
R032, 033, 075, 076, 165		R, Carbon 470 Ω 5% 1/4W	
R044		R, Carbon 1.0K Ω 5% 1/4W	
R022, 024, 025, 067, 068, 103		R, Carbon 2.2K Ω 5% 1/4W	
R036, 038, 047, 071, 079, 081, 161		R, Carbon 10K Ω 5% 1/4W	
R092		R, Carbon 15K Ω 5% 1/4W	
R010, 012, 014, 016, 026, 028, 109, 111, 113, 117, 129, 135, 137, 139, 141, 153		R, Carbon 22K Ω 5% 1/4W	
R069, 070, 154, 155		R, Carbon 47K Ω 5% 1/4W	
R159		R, Carbon 220K Ω 5% 1/4W	
VR001, 003, 004	41085055	R, Variable 1K Ω 0.1W	
VR002	41085056	R, Variable 2K Ω 0.1W	
C006, 026		C, Ceramic 50V 0.1 μ F	
C008, 009, 010, 012, 013, 014, 015, 029		C, Ceramic 50V 0.01 μ F	
C018, 021		C, Ceramic 50V 0.022 μ F	
C31		C, Ceramic 50V 330pF	
C001		C, Ceramic 50V 390pF	
C002		C, Ceramic 50V 100pF	
C016, 020		C, Film 50V 3900pF	
C017, 019		C, Film 50V 5% 0.022 μ F	
C032		C, Elec. 16V 10 μ F	
C004		C, Elec. 50V 1 μ F	
C022, 023		C, Elec. 50V 0.47 μ F	
C024		C, Elec. 50V 2.2 μ F	
C005, 030		C, Elec. 50V 10 μ F	
RL001	65604056	Relay 12V 30MA	

Reference No.

Part No.

Description

Remarks

TU-VIF

PWB

ASS'Y

(81207E01)

TR001	35049700	TR, 2SC388A		
TR005, 006, 007	35501131	TR, 2SA1175 (E, F, H, J)		
TR004	35520111	TR, 2SB733 (K)		
TR002, 003, 008	35541931	TR, 2SC2785 (E, F, H, J)		
IC002	37001031	IC HA1124 (SND)		
IC001	37007011	IC TA7607AP (VIF)		
R023, 038	40002017	R, Solid	22Ω 10%	1/4W
R004, 049		R, Carbon	68Ω 5%	1/6W
R001		R, Carbon	82Ω 5%	1/6W
R025		R, Carbon	220Ω 5%	1/6W
R005, 007, 024, 027, 033, 041		R, Carbon	330Ω 5%	1/6W
R015		R, Carbon	470Ω 5%	1/6W
R006		R, Carbon	680Ω 5%	1/6W
R008, 018, 019, 032		R, Carbon	1.0KΩ 5%	1/6W
R028, 040		R, Carbon	1.2KΩ 5%	1/6W
R003		R, Carbon	1.5KΩ 5%	1/6W
R010		R, Carbon	2.2KΩ 5%	1/6W
R048		R, Carbon	2.4KΩ 5%	1/6W
R011		R, Carbon	2.7KΩ 5%	1/6W
R035		R, Carbon	4.7KΩ 5%	1/6W
R002		R, Carbon	5.6KΩ 5%	1/6W
R029		R, Carbon	6.8KΩ 5%	1/6W
R036, 039		R, Carbon	10KΩ 5%	1/6W
R013, 050		R, Carbon	12KΩ 5%	1/6W
R037		R, Carbon	18KΩ 5%	1/6W
R031		R, Carbon	33KΩ 5%	1/6W
R030		R, Carbon	39KΩ 5%	1/6W
R020, 021, 022		R, Carbon	47KΩ 5%	1/6W
R016		R, Carbon	100KΩ 5%	1/6W
R017		R, Carbon	180KΩ 5%	1/6W
R014		R, Carbon	220KΩ 5%	1/6W
R009		R, Carbon	560KΩ 5%	1/6W
R012		R, Carbon	330Ω 5%	1/4W
R026		R, Carbon	390Ω 5%	1/4W
R042		R, Carbon	10KΩ 5%	1/4W
VR001	41085058	R, Variable	5KΩ	0.1W
C003, 007, 015		C, Ceramic	50V	0.01μF
C017, 018		C, Ceramic	50V	470pF
C001, 002, 004, 005, 006, 019, 020, 030		C, Ceramic	50V	0.01μF
C009		C, Ceramic	50V	470pF
C014		C, Ceramic	50V	39pF
C031		C, Ceramic	50V	12pF
C024		C, Ceramic	50V	15pF
C025		C, Ceramic	50V	68pF
C012, 013		C, Ceramic	50V	3pF
C034		C, Film	50V	4700pF
C008		C, Tantalum	16V	2.2μF

Reference No.	Part No.	Description	Remarks
C026		C, Elec. 16V 220μF	
C022		C, Elec. 50V 4.7μF	
C027, 033		C, Elec. 16V 10μF	
C023, 028, 029, 035		C, Elec. 16V 47μF	
C016		C, Elec. 16V 100μF	
C036		C, Elec. 50V 1.0μF	
L004	61072122	Coil Filter 15μH ±10%	
L006	61072123	Coil Filter 18μH ±10%	
L005	61072129	Coil Filter 56μH ±10%	
FL003, 004	61102003	SIF Filter SFE5.5MB	
FL002	61111004	Ceramic Trap 5.5MHz	
FL001	61120006	VIF SAWF 38MF1024	
T003	61815087	Phase Det Coil	
L002	61815094	Coil, Matching (A)	
L003	61815095	Coil, Matching (B)	
T001, 002	61815097	VIF Trans.	

TIMER	PWB	ASS'Y (81240F01)
	16430401	LED Holder
	16434872	LED Holder A
	16627811	Indicator Sheet (2)
TR02, 05, 11	35501131	TR, 2SA1175 (E, F, H, J)
TR01, 04, 06, 07, 08, 09, 10	35541931	TR, 2SC2785 (E, F, H, J)
TR03	35542518	TR, 2SC1317NC R
D001, 003, 004, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018, 019, 020, 021, 042, 043, 044, 045, 046, 047	36003955	Silicon Diode, RV35V
D022, 023, 024, 025, 026, 027, 028	36904101	LED Red TLR123
D029	36904102	LED Grn. TLG123A
D030, 031, 032, 033, 034, 035, 036, 037, 038, 039, 040, 041	36904138	LED (Green) TLG113A
D005	36905051	Zener, Diode RD-7.5E B1-H
D002	36905060	Zener, Diode RD-10E B1-H
IC01	37151055	IC MP-2517
IC02	37903166	IC μPA81C (TR-Array)
RM01, 02	39906025	R, Block, 100KΩ M*8
R018		R, Carbon 47KΩ 5% 1/6W
J022		R, Carbon 4.7Ω 5% 1/4W
R006, 008		R, Carbon 1.0KΩ 5% 1/6W
R005		R, Carbon 4.7KΩ 5% 1/6W
R013		R, Carbon 12KΩ 5% 1/6W
R020, 021, 023, 024, 025, 026		R, Carbon 22KΩ 5% 1/6W
R001, 007, 010, 011, 014, 017, 019		R, Carbon 47KΩ 5% 1/6W
R002		R, Carbon 56KΩ 5% 1/6W
R003, 004, 022		R, Carbon 100KΩ 5% 1/6W
R030		R, Carbon 15KΩ 5% 1/4W
R016		R, Carbon 1.0KΩ 5% 1/4W
R012		R, Carbon 560Ω 5% 1/4W
R015		R, Carbon 1.0KΩ 5% 1/4W
R009		R, Carbon 3.3KΩ 5% 1/4W
R027		R, Carbon 6.2KΩ 5% 1/4W
R028		R, Carbon 100KΩ 5% 1/4W

Reference No.	Part No.	Description	Remarks
C004, 006		C, Ceramic 50V 0.01 μ F	
C001		C, Ceramic 50V 0.1 μ F	
C005		C, Ceramic 50V 47pF	
C003		C, Elec. 25V 10 μ F	
C002		C, Elec. 25V 100 μ F	
SW01, 02, 03, 04, 05, 06, 07, 08, 09	65330045	SW, Tact	
FIP1	67930026	FIP	

H-SYNC DET PWB ASS'Y (81207G01)

TR101	35501131	TR, 2SA1175 (E, F, H, J)	
TR102	35541931	TR, 2SC2785 (E, F, H, J)	
ZD101	36003092	Diode RD2.2EB	
D101	36003955	Silicon Diode, RV35V	
R105		R, Carbon 150 Ω 5% 1/6W	
R104		R, Carbon 3.3K Ω 5% 1/6W	
R106, 108		R, Carbon 10K Ω 5% 1/6W	
R102		R, Carbon 33K Ω 5% 1/6W	
R107		R, Carbon 47K Ω 5% 1/6W	
R103		R, Carbon 470K Ω 5% 1/6W	
C101, 102, 106		C, Ceramic 50V 0.022 μ F	
C103		C, Elec. 50V 1.0 μ F	
C104, 105		C, Elec. 50V 10 μ F	
T101	61815106	Tuning Coil 15,625KHz	

FUNCTION PWB ASS'Y (81240K01)

	16431981	LED Holder	
	16431991	LED Holder	
	16434872	LED Holder A	
	16434882	LED Holder B	
DO14, 015, 016	36001527	Diode 1SS53	
DO06, 011	36904101	LED Red TLR123	
DO03, 004, 005, 007, 008, 013	36904102	LED Grn. TLG123A	
DO01	36904138	LED (Green) TLG113A	
DO02	36904163	LED (Red) TLR113A	
IC002	37101127	IC μ PC-393C	
IC001	37101128	IC LB-1475	
RO30		R, Carbon 3.0K Ω 5% 1/6W	
RO29		R, Carbon 6.8K Ω 5% 1/6W	
RO19		R, Carbon 10K Ω 5% 1/6W	
RO18		R, Carbon 12K Ω 5% 1/6W	
RO26		R, Carbon 15K Ω 5% 1/6W	
RO23, 028		R, Carbon 22K Ω 5% 1/6W	
RO25		R, Carbon 47K Ω 5% 1/6W	
RO22, 027		R, Carbon 560K Ω 5% 1/6W	
RO21		R, Carbon 1.0M Ω 5% 1/6W	
RO17		R, Carbon 3.6K Ω 2% 1/4W	
RO16		R, Carbon 22K Ω 2% 1/4W	
RO31		R, Carbon 560K Ω 5% 1/4W	
RO03, 004, 005, 007, 008, 013		R, Carbon 680 Ω 5% 1/4W	
RO01, 002, 006, 011		R, Carbon 1.0K Ω 5% 1/4W	

Reference No.	Part No.	Description	Remarks
R014, 015, 020		R, Carbon 3.3K Ω 5% 1/4W	
VR001	41085005	R, Variable 1K Ω 0.1W	
SW001, 002	65330040	SW, Push 12	
SW013	65330041	SW, Push	
SW003, 004, 005, 006, 007, 008, 009	65330045	SW, Tact	

CHROMA/PRE	PWB	ASS'Y (81241L01)	
TR211, 225, 226, 306, 307, 308, 501, 502	35501131	TR, 2SA1175 (E, F, H, J)	
TR402, 404, 406, 407, 514	35520111	TR, 2SB733 (K)	
TR201, 205, 208, 210, 214, 215, 216, 219, 223, 224, 227, 228, 229, 301, 302, 303, 310, 312, 401, 403, 504, 505, 509, 510, 513, 515	35541931	TR, 2SC2785 (E, F, H, J)	
TR305	35560611	TR, 2SD774 (K)	
TR405	35561316	TR, 2SD1265 (P)	
TR507, 511	35580604	FET, 2SK152 (4)	
TR202, 203, 204, 206, 207, 209, 220, 311, 313, 503, 506, 512, 601	35541931	TR, 2SC2785 (E, F, H, J)	
TR304, 309	35501131	2SA1175 (E, F, H, J)	
ZD301	36003072	Diode RD-6.2EB	
D206	36003955	Silicon Diode RV35V	
D302, 307, 501, 502, 601, 602	36001527	Diode 1SS53	
D201, 202, 203, 204, 205, 207, 208, 211, 212, 304, 305, 306, 308, 309, 310, 503, 504, 505, 506, 507, 508, 509	36003955	Silicon Diode, RV35V	
ZD401	36905056	Zener, Diode RD-8.2EB3-H	
IC501	37101026	IC CX134A	
IC201	37101028	IC CX136AI	
IC304	37101031	IC CX145	
IC205, 302	37101088	IC CX150B	
IC301	37101089	IC CX832	
IC202, 203, 601, 602	37101102	IC LA7019	
IC303	37151081	IC M58478P	
IC305	37151083	IC HD74LS74AP	
IC308	37151084	IC HD74LS10P	
IC306, 307	37151091	IC HD74LS93P	
R295		R, Carbon 750 Ω 5% 1/6W	
R343		R, Carbon 39 Ω 5% 1/2W	
R415		R, Carbon 270 Ω 5% 1/2W	
R501, 533, 537, 555		R, Carbon 8.2 Ω 5% 1/4W	
R515		R, Carbon 39 Ω 5% 1/4W	
R511		R, Carbon 82 Ω 5% 1/4W	
R215, 258, 261, 267, 275, 330, 377, 512, 608		R, Carbon 100 Ω 5% 1/6W	
R206		R, Carbon 220 Ω 5% 1/6W	
R232, 602		R, Carbon 270 Ω 5% 1/6W	
R334, 504, 517, 520, 524, 527, 601		R, Carbon 390 Ω 5% 1/6W	
R223, 318, 356, 604		R, Carbon 470 Ω 5% 1/6W	
R544		R, Carbon 560 Ω 5% 1/6W	
R301, 302, 519, 528, 550		R, Carbon 620 Ω 5% 1/6W	
R221, 306		R, Carbon 680 Ω 5% 1/6W	
R307		R, Carbon 820 Ω 5% 1/6W	

Reference No.	Part No.	Description	Remarks
R201, 217, 218, 225, 230, 231, 304, 308, 316, 342, 347, 367, 375, 379, 384, 542, 543, 548, 603		R, Carbon 1.0K Ω 5% 1/6W	
R341, 545		R, Carbon 1.2K Ω 5% 1/6W	
R260, 309, 339, 509, 510		R, Carbon 1.5K Ω 5% 1/6W	
R319		R, Carbon 1.8K Ω 5% 1/6W	
R235, 248, 264, 325, 408, 538, 539, 540, 541		R, Carbon 2.2K Ω 5% 1/6W	
R236, 247, 315, 324, 344, 345, 359, 362, 365, 502, 516, 525		R, Carbon 3.3K Ω 5% 1/6W	
R216, 228, 331, 354, 369, 551		R, Carbon 4.7K Ω 5% 1/6W	
R320		R, Carbon 5.1K Ω 5% 1/6W	
R220, 305, 370, 405, 534, 546, 549		R, Carbon 5.6K Ω 5% 1/6W	
R303, 329, 352, 353, 360		R, Carbon 6.8K Ω 5% 1/6W	
R328		R, Carbon 7.5K Ω 5% 1/6W	
R226, 314		R, Carbon 8.2K Ω 5% 1/6W	
R242, 249, 279, 283, 286, 292, 310, 312, 321, 336, 351, 371, 374, 381, 404, 409, 410, 412, 414, 506, 514, 518, 521, 526, 529, 547, 556, 559		R, Carbon 10K Ω 5% 1/6W	
R246, 372		R, Carbon 12K Ω 5% 1/6W	
R503		R, Carbon 13K Ω 5% 1/6W	
R266, 285, 363, 364, 376		R, Carbon 15K Ω 5% 1/6W	
R357, 366		R, Carbon 18K Ω 5% 1/6W	
R210, 211, 212, 214, 276, 373, 557, 561, 562		R, Carbon 22K Ω 5% 1/6W	
R326, 332		R, Carbon 24K Ω 5% 1/6W	
R208, 213, 245, 250, 277, 280, 281, 282, 327, 380, 411, 413, 554, 558		R, Carbon 33K Ω 5% 1/6W	
R322		R, Carbon 39K Ω 5% 1/6W	
R317, 333, 406, 407		R, Carbon 47K Ω 5% 1/6W	
R219, 311, 313, 513		R, Carbon 56K Ω 5% 1/6W	
R358		R, Carbon 68K Ω 5% 1/6W	
R222, 348, 361, 368, 560, 606		R, Carbon 100K Ω 5% 1/6W	
R355		R, Carbon 150K Ω 5% 1/6W	
R202, 207, 227, 229		R, Carbon 220K Ω 5% 1/6W	
R323		R, Carbon 470K Ω 5% 1/6W	
R416	40809875	Fuse Resistor 3.3 Ω 5% 1/4W	
R234		R, Carbon 240 Ω 5% 1/4W	
R390		R, Carbon 47K Ω 5% 1/4W	
R536		R, Carbon 6.8 Ω 5% 1/4W	
R284		R, Carbon 220 Ω 5% 1/4W	
R294		R, Carbon 240 Ω 5% 1/4W	
R335, 507		R, Carbon 430 Ω 5% 1/4W	
R605, 607		R, Carbon 2.0K Ω 5% 1/4W	
R204		R, Carbon 2.2K Ω 5% 1/4W	
R350		R, Carbon 15K Ω 5% 1/4W	
R337		R, Carbon 22K Ω 5% 1/4W	
R262, 265		R, Carbon 33K Ω 5% 1/4W	
R505		R, Carbon 82K Ω 5% 1/4W	
R508		R, Carbon 7.5 Ω 5% 1/4W	
R288		R, Carbon 68 Ω 5% 1/4W	
R530, 531, 553		R, Carbon 120 Ω 5% 1/4W	
R296, 535		R, Carbon 220 Ω 5% 1/4W	
R287, 349		R, Carbon 270 Ω 5% 1/4W	
R289		R, Carbon 300 Ω 5% 1/4W	

<i>Reference No.</i>	<i>Part No.</i>	<i>Description</i>	<i>Remarks</i>
R338		R, Carbon 390Ω 5% 1/4W	
R532		R, Carbon 430Ω 5% 1/4W	
R346		R, Carbon 470Ω 5% 1/4W	
R290, 291		R, Carbon 560Ω 5% 1/4W	
R244, 278, 378, 403		R, Carbon 1.0KΩ 5% 1/4W	
R259		R, Carbon 1.2KΩ 5% 1/4W	
R552		R, Carbon 2.2KΩ 5% 1/4W	
R293		R, Carbon 3.6KΩ 5% 1/4W	
R209		R, Carbon 5.6KΩ 5% 1/4W	
R565		R, Carbon 10KΩ 5% 1/4W	
R263		R, Carbon 15KΩ 5% 1/4W	
R401, 402		R, Carbon 22KΩ 5% 1/4W	
VR507	41085053	R, Variable 300Ω 0.1W	
VR204, 301, 501	41085055	R, Variable 1KΩ 0.1W	
VR203, 503, 504, 505	41085056	R, Variable 2KΩ 0.1W	
VR206, 502	41085057	R, Variable 3KΩ 0.1W	
VR506	41085058	R, Variable 5KΩ 0.1W	
VR205	41085059	R, Variable 10KΩ 0.1W	
VR202	41085060	R, Variable 20KΩ 0.1W	
C231, 257, 304, 308, 326, 339, 501		C, Ceramic 50V 0.01μF	
C503		C, Ceramic 50V 0.022μF	
C204, 206, 221, 229, 255, 258, 259, 301, 328, 336, 340, 346, 517, 525, 530		C, Ceramic 50V 0.047μF	
C256		C, Ceramic 50V 0.047μF	
C323, 343		C, Ceramic 50V 220pF	
C350		C, Ceramic 50V 470pF	
C344		C, Ceramic 50V 680pF	
C360		C, Ceramic 25V 0.01μF	
C604, 607		C, Ceramic 25V 0.022μF	
C207, 212, 214, 508, 509, 514, 515		C, Ceramic 25V 0.047μF	
C321		C, Ceramic 25V 0.1μF	
C242		C, Ceramic 25V 0.01μF	
C222, 223, 224, 225, 230, 232, 233, 234, 235, 250, 251, 261, 262, 305, 307, 314, 327, 329, 338, 355, 362, 502, 505, 608, 610		C, Ceramic 50V 0.01μF	
C507, 511, 513, 524, 534		C, Ceramic 50V 0.022μF	
C246, 247		C, Ceramic 50V 270pF	
C352		C, Ceramic 50V 220pF	
C320, 528		C, Ceramic 50V 330pF	
C211, 351, 522		C, Ceramic 50V 470pF	
C354, 520		C, Ceramic 50V 680pF	
C356, 357		C, Ceramic 50V 820pF	
C201, 217, 254, 527		C, Ceramic 16V 0.022μF	
C202, 203, 244, 245, 248, 249, 332, 510, 512, 523		C, Ceramic 25V 0.01μF	
C603		C, Ceramic 50V 10pF	
C227		C, Ceramic 50V 12pF	
C316		C, Ceramic 50V 27pF	
C303		C, Ceramic 50V 47pF	
C605, 606		C, Ceramic 50V 82pF	
C333, 334		C, Ceramic 50V 150pF	
C209		C, Ceramic 50V 30pF	
C208		C, Ceramic 50V 180pF	
C226		C, Ceramic 50V 39pF	
C536		C, Ceramic 50V 82pF	

Reference No.	Part No.	Description	Remarks
C531		C, Ceramic 50V 100pF	
C306		C, Ceramic 50V 15pF	
C529		C, Ceramic 50V 18pF	
C330, 331		C, Ceramic 50V 27pF	
C518, 519		C, Ceramic 50V 51pF	
C210		C, Ceramic 50V 56pF	
C349		C, Ceramic 50V 100pF	
C315		C, Ceramic 50V 120pF	
C363, 521, 609		C, Ceramic 50V 180pF	
C318		C, Film 50V 1000pF	
C324		C, Film 50V 4700pF	
C219, 311		C, Film 50V 0.022μF	
C319		C, Film 50V 5% 4700pF	
C345		C, Film 50V 5% 0.01μF	
C313		C, Film 50V 5% 0.022μF	
C216		C, Elec. 50V 4.7μF	
C504, 526		C, Elec. 16V 33μF	
C205, 218, 228, 302, 337, 347, 535		C, Elec. 25V 47μF	
C361, 506		C, Elec. 50V 0.47μF	
C236, 310, 312, 317, 322, 348, 532, 533		C, Elec. 50V 1.0μF	
C213, 220, 516		C, Elec. 50V 2.2μF	
C215, 238, 353, 358, 359		C, Elec. 50V 4.7μF	
C325, 335, 341, 342		C, Elec. 50V 10μF	
L208	61071624	Coil, Filter 39μH(S)	
L508, 509	61072005	Coil, Filter 0.56μH	
L201	61072018	Coil, Filter 0.68μH ±10%	
L204, 501	61072020	Coil, Filter 10μH ±10%	
L502, 503, 601	61072022	Coil, Filter 15μH ±10%	
L202, 207	61072023	Coil, Filter 18μH ±10%	
L304	61072024	Coil, Filter 22μH ±10%	
L506	61072031	Coil, Filter 82μH ±10%	
L203, 301, 302, 305, 307, 602	61072040	Coil, Filter 470μH ±10%	
L303, 507	61072044	Coil, Filter 1000μH ±10%	
L306	61072223	Coil, Filter 6.8μH	
L504, 505	61072224	Coil, Filter 8.2μH	
L206	61091006	Coil, Filter 18μH	
CF301	61137001	Ceramic, Filter 5.12MB	
FL204	61551022	Delay Line 2HADLSG544N	
DL201	61551025	Delay Line 1H	
T201	61815058	Band Pass Trans 4.43MHz	
T302	61815063	4.43MHz Tuning Trans (1)	
T301	61815064	4.43MHz Tuning Trans (2)	
TS01, 502	61823012	RF Input Transformer	
X302	64004108	4.433619MHz X'tal (15pF)	
X301	64004109	4.433619MHz X'tal (47pF)	
FL201	79552028	Filter, BPF 4.43MHz	
FL202	79552029	Filter, LPF 1.5MHz	
FL203	79552034	Filter, BPF 4.43MHz	

Reference No.	Part No.	Description	Remarks
PST	PWB	ASS'Y (81240Q01)	
TR002	35501131	TR, 2SA1175 (E, F, H, J)	
TR003	35541906	TR, 2SC2785 (F)	
TR001	35541931	TR, 2SC2785 (E, F, H, J)	
TR004	35542518	TR, 2SC1317NC R	
D001, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 017, 019, 021, 023, 025, 027, 028, 029, 030, 031, 032, 039, 040	36001527	Diode 1SS53	
D002, 016, 018, 020, 022, 024, 026, 033, 034, 035, 036, 037, 038	36003955	Silicon Diode, RV35V	
D041	36905060	Zener, Diode RD-10E B1-H	
IC001	37101103	IC μ PC1363C (CH SEL)	
R009		R, Carbon 120K Ω 5% 1/6W	
R008		R, Carbon 150K Ω 5% 1/6W	
R006		R, Carbon 220K Ω 5% 1/4W	
R018		R, Carbon 300 Ω 5% 1/4W	
R007		R, Carbon 100 Ω 5% 1/4W	
R010, 011		R, Carbon 470 Ω 5% 1/4W	
R014, 015, 016		R, Carbon 10K Ω 5% 1/4W	
R012, 013		R, Carbon 15K Ω 5% 1/4W	
R001, 002, 003		R, Carbon 47K Ω 5% 1/4W	
R017		R, Carbon 68K Ω 5% 1/4W	
R005		R, Carbon 470K Ω 5% 1/4W	
R004		R, Carbon 1.0M Ω 5% 1/4W	
PST1	41098334	VR Tuning 12KEY	
C006		C, Ceramic 50V 0.022 μ F	
C004		C, Ceramic 50V 0.1 μ F	
C005, 010, 011		C, Elec. 16V 10 μ F	
C007		C, Elec. 25V 4.7 μ F	
C009		C, Elec. 50V 0.47 μ F	
C001, 008, 012		C, Elec. 50V 1 μ F	
C002, 003		C, Elec 50V 2.2 μ F	
SW001	65180009	Slide Switch	

LINE FILTER	PWB	ASS'Y (81205S01)	
C801		C, Metal Film 250V 0.022 μ F	
L801	61826003	Line Filter	
F801	66671004	Fuse 1.6A 250V SEMKO 20MM	
		Fuse Holder	
		PWB Line Filter PWV-437	
		Connector Pin 3P	

Reference No.	Part No.	Description	Remarks
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TU SENS PWB ASS'Y (81203TV1)

R001, 005	401K5649	R, Carbon	100Ω	1/8W
R002	401K5699	R, Carbon	12KΩ	1/8W
R004	401K5715	R, Carbon	56KΩ	1/8W
R003	401K5733	R, Carbon	330KΩ	1/8W

EVER 12V TR SASSY

TR001	35065416	Transistor 2SD882P
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SYS 12V TR SASSY

TR002	35561316	Transistor 2SD1265 P
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REG 10V TR SASSY

TR006	35561316	Transistor 2SD1265 P
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TAPE COUNTER SASSY

TR001	35541931	Transistor 2SC2785 (E.F.H.J)
C001	43993024	C, Elec. 16V 10μF
C002	43993026	C, Elec. 16V 33μF
MS001	79599384	Sensor, Magnet DM-101A

MC-Service